

APPENDIX 4 - ACID SULPHATE SOIL INVESTIGATION AND MANAGEMENT PLAN (TECTONIC GEOTECHNICAL 2019)



ACID SULFATE SOIL INVESTIGATION & MANAGEMENT PLAN

NORTH HARBOUR MIXED INDUSTRY AND BUSINESS AREA (MIBA)



**Report for North Harbour Holdings Pty Ltd
Report 19210-001-Rev0
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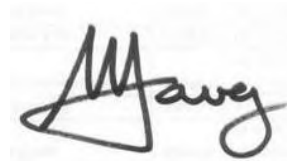
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APPENDICES

APPENDIX A

Current Investigation Borehole Logs & Explanatory Notes

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1.0 INTRODUCTION

North Harbour Holdings Pty Ltd (North Harbour) is proposing the development of an integrated industrial and business precinct known as the Mixed Industry and Business Area (MIBA), as the next stage of land development at North Harbour. The proposed MIBA development encompasses several large lots and incorporates a total area of approximately 260 hectares.

This report details the results of an acid sulfate soil (ASS) investigation undertaken to assess the environmental hazard associated with the disturbance of ASS during proposed development and incorporates an overarching ASS Management Plan (ASSMP) to demonstrate how potential environmental risks will be mitigated during development.

The investigation was completed by Tectonic Geotechnical Pty Ltd (Tectonic) for North Harbour in accordance with proposal P19304-Rev1, dated 4 September 2019.

2.0 PROPOSED DEVELOPMENT

The project holds preliminary approval from the Moreton Bay Regional Council. Because of its former status as a project of state significance, the conditions of approval require this ASSMP to be submitted to the office of the QLD Coordinator General for state government approval. Several previous ASSMP's have been previously submitted and approved for other works elsewhere on the overall project site.

The project area is located adjacent to the Bruce Highway on the southern bank of the Caboolture River near Burpengary, approximately 8 km inland from the coastline. The development area borders tidal waters of the Caboolture River and has relatively low ground surface elevations across the site, ranging from around RL 2.0 m to RL 19 m AHD.

Text Figure 1 illustrates the general NEBP development area and proposed MIBA precinct.



Text Figure 1: General NEBP and MIBA Site Location

The MIBA precinct is expected to facilitate a mix of industry and business use areas, and will consist of the development of low, medium and high density industrial and commercial spaces, associated road and infrastructure networks (including an arterial connection to other NEBP precincts), compensatory cut areas, drainage wetlands and landscaped public space.

2.1 Proposed Site Disturbance Activities

A set of bulk earthworks design plans have been prepared by the KN Group Pty Ltd (Dwg No.: 18-203-01 to 18-203-26, dated March 2019) which indicate the extent of proposed earthworks disturbances to be completed as part of the MIBA site development.

A general layout plan is attached as Figure 1 at the end of this report which illustrates the general development layout and identifies key works which have potential to disturb ASS.

A large proportion of the proposed development site exists at or above an elevation of RL 5 m AHD, on geology which is not associated with the occurrence of ASS and therefore will not have potential to disturb or impact on ASS during development. Works proposed for areas above RL 5 m present negligible risk and may be carried out without need for specific ASS management.

Predicted activities and sources of potential ASS disturbance which are likely to occur below RL 5 m AHD or on geological profiles likely to contain ASS are detailed below.

Proposed Wetlands – Wetland 1 to 5

Required to facilitate urban stormwater management design. Excavation of between 0.5 m to 2.5 m below ground level (BGL) is anticipated across five individual wetlands areas. Proposed wetlands range in size from 1.3 ha to 7.5 ha, with material won from excavation expected to be reused as fill across other parts of the site.

Moreton Bay Boulevard / Urban Arterial Bridge Crossing (Across Raff Creek)

Preliminary earthworks required for construction of the bridge abutment, connecting the existing North Harbour Residential West precinct with the MIBA precinct. Excavations of up to 1.5 m BGL are anticipated for preparatory earthworks across an approximate 1.7 ha area.

It is noted that construction of the bridge may involve more extensive disturbances for bridge foundation works. Such works would be further assessed and individually managed, as part of the bridge design and construction works.

Compensatory Cut – Buchanan Road Drainage Reserve

Required to achieve flood volume offsets and to develop effective drainage pathways. Cut / fill earthworks ranging from + 0.5 m to - 2.0 m from the existing ground surface level are anticipated across an approximately 15 ha area. Material won from excavation is expected to be reused as fill across other parts of the site.

Compensatory Cut – Borrow Area

Required to achieve flood volume offsets and to develop effective drainage pathways. Excavation of between 1.5 m to 2.5 m BGL are anticipated across an approximately 16 ha area. Material won from excavation is expected to be reused as fill across other parts of the site.

General Development Earthworks (Situated below RL 5 m)

Typically consisting of bulk filling for the raising and levelling of urban and industrial allotments and road embankments across approximately 50 ha, typically located below RL 5 m. Anticipated earthworks are expected to be limited to stripping of topsoil (150 to 300 mm BGL) and bulk filling extending up to 3 m above existing ground level. Some disturbance of natural ground may occur during construction of stormwater and civil infrastructure but are expected to be typically limited to within 1 m of the existing ground level.

3.0 INFORMATION ON ACIDIC SOILS

There are two principal forms of acidic soil associated with the proposed development precinct. The first type is acid sulfate soil (ASS) which can be damaging to the environment and built structures. Development involving ASS must comply with the requirements of state and local regulations pertaining to ASS. This includes the State Planning Policy, the Morton Bay Regional Council's Planning Policy and their attendant guidelines.

The second type of acidity present in soil is non-sulfuric acidity, termed Acidic, Non-Sulfuric acidity (ANS). Soils with non-sulfuric acidity are very common in leached landscapes throughout coastal Queensland. These types of soil are mentioned in the Queensland Acid Sulfate Soil Technical Manual, which states that it is unnecessary to regulate these acidic soils as is required for ASS due to their inherent low risk. However, to operate within the requirements of Queensland environmental law, it is prudent to manage the acidity in line with best practice management criteria, if large volumes of ANS soils are going to be disturbed. It is noted that large volumes of ANS soils have been disturbed without management strategies over many years without any reported environmental impact. This type of acidity thus presents significantly less environmental hazard than disturbance of ASS.

3.1 Acid Sulfate Soil

ASS is common in low-lying coastal areas of Queensland, typically in Holocene to Pleistocene (Quaternary) age alluvial sediments, which typically exist below an elevation of RL 5.0 m AHD. Such areas are often characterised by the presence of estuaries, swamps, floodplains, salt marshes and mangroves. The affected soils contain iron sulfides, most frequently pyrite, which, when exposed to air, can oxidise to form sulfuric acid.

When these soils are maintained in their natural setting (generally anaerobic conditions below the groundwater table or sea level), the iron sulfides remain trapped *in situ* and are unable to oxidise, therefore the ASS remains in a stable state. However, where disturbances such as civil construction or development expose ASS to aerobic conditions, the iron sulfides can oxidise and form sulfuric acid, resulting in the disturbed soil becoming acidic. Soils containing iron sulphides are commonly termed *potential ASS (PASS)*. Existing acidity attributed to the past oxidation of ASS may also be present as a result of the previous exposure of PASS material to aerobic conditions. This is commonly termed *actual ASS (AASS)*. Also included in the definition of AASS are soils that contain sparingly soluble salts such as jarosite, that can form during the oxidation of sulfides and are capable of generating further acidity as they later dissolve or hydrolyse under acidic conditions. Potential acidity bound up in these salts is referred to as 'retained acidity'.

Sulfuric acidity created by disturbance of ASS presents an environmental risk due to its potential to rapidly alter the pH of soil and water within an environment and increase the mobility of metals which may be naturally present in the soil (i.e. iron and aluminium), thereby producing a leachate contaminated by both high levels of acidity and metals. Associated chemical reactions in highly affected waters can also strip the leachate and the receiving environment of dissolved oxygen. Such leachate, if released into sensitive environments, can have significant adverse effects including degradation of the water quality in receiving areas, fish disease/kills, reduced crop productivity, corrosion of built structures and health related issues. In view of these potential effects, it is critical that any development that occurs within an area likely to contain ASS is planned, managed and monitored appropriately so as to minimise or remove the risk of adverse environmental outcomes.

3.2 Non-sulfuric Acidity

ANS is common in residual and leached landscapes, and generally occurs as a result of hydrolysis reactions associated with leaching of the soils or the breakdown of organics. These forms of acidity are not related to ASS and are not considered as potentially harmful as ASS due to their generally weak nature and low mobility. Where significant volumes of soils with non-sulfuric acidity are expected to be disturbed by the

proposed development, appropriate risk assessment and, if necessary, management controls may be undertaken to ensure potential environmental hazards are appropriately mitigated.

ANS can be identified during an acid based account, through measurement of soluble sulfur (S_{KCl}) following TAA analysis. ANS soils are identified by the following criteria:

- TAA exceeding 18 mol H⁺/tonne.
- low soluble sulfur (e.g. $S_{KCl} < 0.03\%$)
- no reportable oxidisable sulfur (using S_{CR} or S_{POS} test methods)
- no visual or reportable jarosite, or similar acid-producing iron or aluminium hydroxy-sulfate minerals (using S_{RAS} or S_{NAS} test methods).

Risk assessment for ANS is prudent for soil that exceed the ASS action criteria for management (i.e. existing acidity above 18 mol H⁺/tonne), however as ANS soils are generally formed as a result of a slow soil weathering process, the acidity is typically well bound to the soil and is not readily mobile, therefore the potential for existing acidity to leach and create environmental issues is relatively low where levels of acidity are generally less than 50 mol H⁺/tonne.

When large volumes of ANS soils are excavated and placed in locations where they may be subject to readily leached, acidity and metals may be transported out of the soil. For this reason, a series of management strategies have been defined to manage the risk associated with ANS soils. ANS management generally involves neutralisation with agricultural lime, using liming rates guided by quantitative test results.

As the degree of risk posed by ANS is not as potentially hazardous as ASS, neutralisation may typically be undertaken through placement of guard layers, without need for inclusion of safety factors, to intercept and neutralise any leachate. Thorough mixing of treated soil, a fully contained treatment pad or intensive verification testing are not required. The lime guard layers are considered adequate to intercept any potential acidic leachate which may be caused by ANS.

4.0 ASS INVESTIGATION & ASSESSMENT

A site investigation has been undertaken incorporating a review of published geological and ASS risk mapping information and site sampling and analysis, to identify and characterise the presence or absence of ASS across the site, and to quantify potential risks based on the disturbances proposed.

Site investigation has been carried out in general accordance with “*Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils (ASS) in Queensland*” (Ahern et al., 1998), and “*Queensland Acid Sulfate Soil Technical Manual: Soil Management Guidelines v4.0*” (Dear et al., 2014), being the applicable guidelines for identification and management of ASS in Queensland.

4.1 Investigation Methodology

QASSIT guidelines suggest two sampling holes per hectare for sites bigger than 4 ha. The subject site measures approximately 260 ha, and as such would require approximately 520 boreholes to provide an assessment to this frequency. A site investigation of this magnitude is considered unnecessary and not technically justified, given the availability of reliable desktop information, generally consistent geological units/topography and an understanding of site conditions provided from previous NEBP site investigations within similar geomorphological conditions (with which Tectonic has been directly involved).

Additionally, an investigation to this level would be expected to provide no significant benefit in terms of reduction of environmental or geotechnical risks associated with the proposed development.

Based on these considerations, a more holistic approach combining an understanding of the site geology, topography, aerial imagery and other supporting data was used to provide a site model. This model has been confirmed via targeted site investigations, soil sampling and laboratory analyses.

From a development perspective, the approach described above allows for distinguishing areas with potentially higher ASS risk from areas with potentially limited ASS risk, from which suitable management

methodology can be developed. This distinction is based on factors such as topographical location, regional geology, soil type, proposed development characteristics and other environmental constraints.

4.2 Desktop Assessment

4.2.1 Regional Geology

A Regional Geology Plan illustrating geology across the proposed MIBA layout is attached as Figure 2 at the end of this report.

Reference to the Geological Survey of Queensland 1:100,000 scale Caboolture and Brisbane maps, indicate that the North Harbour development site has three general geological landforms. These include:

- **Triassic to Jurassic age Landsborough Sandstone (RJI)**
- **Quaternary age Alluvial Sediments – consisting of Estuarine (Qe) and Flood Plain (Qa) Alluvium**
- **Holocene age River Terrace Alluvium (Qha)**

The occurrence of ASS and acidic soil differs significantly between these three formations but is considered relatively consistent within each geological unit. Thus the environmental hazard posed by ASS can be characterised from section to section using local geology supported by quantitative testing completed within each unit.

Geology present in areas above the RL 5 m contour consists mostly of Landsborough Sandstone, with a veneer of flood plain alluvium generally skirting some of the lower valleys. The formation of Landsborough Sandstone is not conducive to the occurrence of ASS and given the elevation of the flood plain alluvium (being underlain by Landsborough Sandstone), no potential exists for Holocene or Pleistocene age ASS materials to exist. The materials located above an elevation of RL 5 m are therefore not considered likely to contain ASS.

Areas located below RL 5 m, comprises of typically alluvial geology, however the alluvium was observed to be quite shallow in some areas, sometimes overlying residual material, particularly near geological boundaries close to RL 5 m. ASS is more likely to be present within younger Quaternary estuarine alluvium and Holocene river terrace deposits which are located close to Raff Creek and the Caboolture River.

4.2.2 Regional ASS Mapping

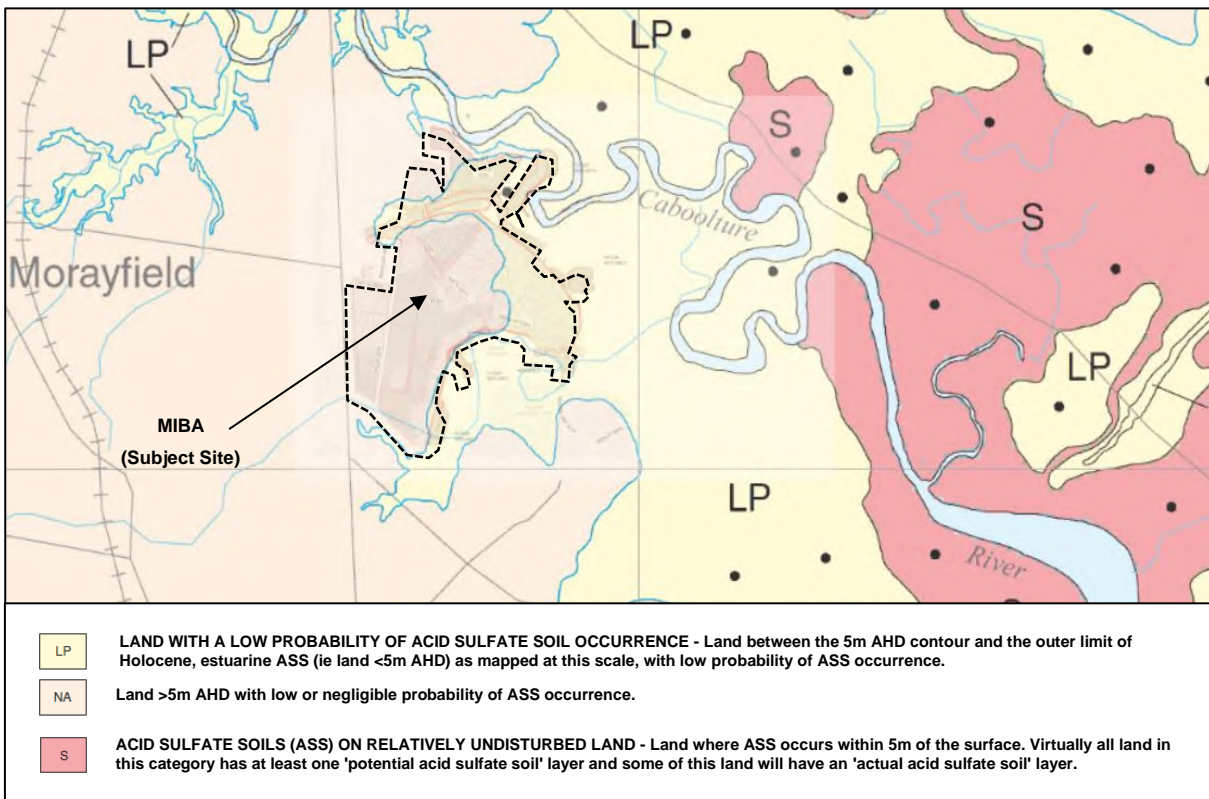
An extract from the Queensland Government's *Acid Sulfate Soils Redcliffe to Teewah Map 2* (NR&M-SEA-I-A0 3261) covering the region is shown in Text Figure 2 over page.

Mapping indicates the presence of primarily **Low Probability "LP"** land types across sections of the site situated below RL 5 m contour. Areas located above the RL 5 m contour are considered beyond the outer limit of Holocene estuarine ASS (i.e. land < 5 m AHD) and therefore have very low probability of ASS occurrence.

This description of the LP land type, especially across lower lying Quaternary estuarine alluvium located near Raff Creek, does not match with regional geological mapping discussed above in Section 4.2.1, or past site experience. Our experience is that some weak AASS exists within these lower lying areas.

It is noted that the established boundaries and risk probability have been established using ground contours and known geological boundaries with limited field checking. While ASS risk mapping does indicate a low probability of ASS being present across the entire site, some potential for ASS to exist would be likely across lower estuarine alluvial soils.

The presence nor absence of ASS at a site based on broad-scale mapping alone is not definitive. The presence or absence of ASS at a site may only be confirmed by completion of a site investigation, involving site assessment and quantitative analyses.



Text Figure 2: Redcliffe - Teewah Acid Sulfate Soils Map 2 (NR&M-SEA-I-A0 3261)

4.2.3 Supplementary Site Data

A number of previous ASS investigations have been completed as part of the ongoing development of North Harbour, which has involved completion of over 300 investigation boreholes, including pH field screen testing on over 2,950 samples, and quantitative analyses on over 760 samples using the chromium reducible sulfur (CRS) suite.

ASS investigation data relevant to the proposed works has been sourced from the following reports:

- North East Business Park - Residential West, *Acid Sulfate Soil Investigation Report and Management Plan (Revision 8)*, prepared by Coffey Geotechnics Pty Ltd (Report No.: GEOTKPAR01976AC-D(Rev8), dated 22 December 2015).
- *Acid Sulfate Soil Investigation & Management Plan*, Proposed Sewer Gravity Main, North Harbour, prepared by Tectonic Geotechnical Pty Ltd (Report No.: 17348-004-Rev0, dated 26 June 2018).

In addition to boreholes completed as part of the current site investigation, an additional 13 ASS investigation sites, located within 25 m of proposed works (Wetlands 1 to 3 and Moreton Bay Blvd / Urban Arterial Bridge Connection), were able to be included as part of the assessment. Supplementary ASS data obtained for these boreholes includes approximately 116 pH field screen results and 41 quantitative test results.

4.3 Field Investigation

Based on the basic geographical model and consideration for proposed key disturbance areas, a total of 85 investigation boreholes were drilled across the site to characterise sub surface soil conditions in the key areas of proposed disturbance. The investigation targeted all development disturbances associated with the proposed works, including proposed earthworks for urban development areas, compensatory cut zones and proposed constructed wetlands. The respective borehole locations and depths, relating to proposed disturbance areas are set out in Table 1.

Table 1: Investigation Summary

Proposed Works	Area	Proposed Disturbance	Current Boreholes	Target Depth	Available Supplementary Data	Investigation Frequency
Wetland 1	2.9 ha	Up to 1.5 m Cut	BH01 to BH03	2.5 m BGL	TP305 to TP309	> 2 / ha
Wetland 2	2.0 ha	Up to 1.0 m Cut	BH04 to BH05	2.0 m BGL	TP301, TP315, TP316, TP318 & TP319	> 3 / ha
Wetland 3	1.3 ha	Up to 0.5 m Cut	BH06 to BH08	2.0 m BGL	2x (TP334 & TP336)	> 2 / ha
Wetland 4	4.7 ha	Up to 0.5 m Cut	BH07 to BH11	2.0 m BGL	-	1 / ha
Wetland 5	7.5 ha	Up to 2.5 m Cut	BH12 to BH20	3.5 m BGL	-	1 / ha
Moreton Bay Blvd / Urban Arterial Connection	1.7 ha	Up to 1.5 m Cut	BH21 to BH24	2.5 m BGL	1x BH1	> 2 / ha
Buchanan Road Drainage Reserve	15 ha	Up to 0.5 m Fill Up to 2 m Cut	BH25 to BH39	3.0 m BGL	-	1 / ha
Borrow Area	16 ha	Up to 2.5 m Cut	BH40 to BH55	3.5 m BGL	-	1 / ha
General Development Earthworks (Located < RL 5 m)	~ 50 ha	Up to 0.5 m Cut Up to 3 m Fill	BH56 to BH85	2.0 m BGL	-	< 1 / ha

Fieldwork was carried out between 11 September and 27 September 2019 by experienced geotechnical engineers, engineering geologists and environmental scientists from Tectonic. Borehole investigation locations were positioned utilising hand-held GPS units with reported accuracy of ± 3 m.

Boreholes were drilled using a 100 mm auger (with TC bit) mounted on a 4WD utility, operated by a licensed driller from Contract Drilling Pty Ltd. Boreholes were logged by Tectonic in accordance with the AS1726-2017 *Geotechnical Site Investigations*. All boreholes were backfilled with drill spoil on completion, with excess spoil mounded and compacted at the surface.

Where encountered, details of groundwater seepage and/or depth to the standing groundwater table were recorded on borehole logs and are summarised in Sections 4.4 and 4.5.

The depth and locations of investigation boreholes were determined based on the extent and depth of the proposed disturbance occurring within each development area (Refer Table 1). The target depths for all boreholes completed during the site investigation exceeded the proposed disturbance depths by a minimum 1 m, except where refusal in low strength sandstone (non-ASS material) was encountered.

Soil samples were collected at 0.25 m depth intervals from all boreholes for laboratory assessment. ASS sampling protocols were observed in the field in order to restrict the potential for oxidation of samples prior to laboratory testing.

Borehole locations are illustrated in the Investigation Location Plan attached as Figure 3. Borehole logs, along with explanatory notes explaining the terms and symbols used, are presented in Appendix A.

4.3.1 Laboratory Testing

Collected soil samples were dispatched to Eurofins MGT, a NATA accredited analytical laboratory located in Brisbane.

All soil samples collected during site investigations (No. 850) were screened to determine field pH (pH_F) and pH after peroxide oxidation (pH_{FOX}). These results allow a qualitative assessment of the ASS nature of the sample.

Of the 850 soil samples submitted for screen testing, 221 samples were selected to undergo quantitative analysis by the Total Actual Acidity (TAA) and Chromium Reducible Sulfur (CRS) suite in accordance with the ASS Method 23F (TAA) and 22B (CRS) laboratory procedures.

The quantum of any actual acidity was able to be assessed using TAA while soluble (pre-oxidation) sulfur (S_{KCl}) testing was used to assess the nature of the measured acidity.

The pH screening and CRS laboratory test results are tabulated in Table B1 (Appendix B), where ASS laboratory test certificates are also presented.

4.4 Subsurface Conditions

The subsurface conditions encountered in the boreholes were generally consistent with the regional geological formations described in Section 4.2.1.

Wetland 1 (BH01 to BH03 and TP305 to TP309)

Subsurface conditions encountered across Wetland 1 consisted 0.5 m to 1.2 m depth of flood plain alluvium consisting primarily of stiff to very stiff silty and sandy clays, underlain by very stiff to hard residual sandy clay and very dense clayey sand. Distinctly weathered sandstone was encountered from 1.1 m to 2.25 m BGL, in all three current boreholes and in supplementary test pits TP306 to TP309. No seepage or standing groundwater was observed in any of investigation sites.

Wetland 2 (BH04 to BH05 and TP301, TP315, TP316, TP318 & TP319)

Subsurface conditions encountered across Wetland 2 comprised primarily of flood plain alluvium consisting interlayered firm to very stiff silty / sandy clay and clay at depth ranging from 0.2 m at the north-western end, to beyond the target depth of 2 m BGL at south-eastern end (nearer Raff Creek). The northern end was typically underlain by residual sandy clay becoming distinctly weathered sandstone. Groundwater seepage was observed across the south-eastern side of Wetland 2, with standing groundwater level recorded about 1 m BGL. Groundwater is expected to be more prevalent in closer proximity to Raff Creek.

Wetland 3 (BH06 to BH07 and TP334 & TP336)

Subsurface conditions encountered across Wetland 3 comprised interlayered firm to stiff silty clay, clayey silt and sandy clay (estuarine / river terrace alluvium) to beyond the investigation target depth of 2 m. Groundwater seepage was not observed in any of the current boreholes completed within the wetland footprint, however standing groundwater is noted on supplementary test pit logs completed approximately 50 m south of the wetland site. Standing groundwater in this area is expected to exist approximately 1.0 m to 1.5 m BGL.

Wetland 4 (BH08 to BH12)

Subsurface conditions encountered across Wetland 4 comprised interlayered firm to very stiff clayey silt and silty / sandy clay (estuarine / river terrace alluvium) to beyond the investigation target depth of 2 m. No seepage or standing groundwater was observed in any of investigation sites within Wetland 4.

Wetland 5 (BH13 to BH20)

Subsurface conditions encountered across Wetland 5 comprised mostly of stiff to hard silty / sandy clay extending to beyond 3.5 m BGL (river terrace alluvium), with some loose to medium dense clayey sand (estuarine alluvium) encountered below 2.5 m BGL at the north-eastern end nearer the bank of the Caboolture River (BH20).

Groundwater seepage was generally associated with more permeable sandy materials located closer to Caboolture River, with groundwater inflow recorded in BH20 at about 1.5 m BGL. It is noted that surface elevation at BH20 was several metres lower than the remaining wetland area.

Moreton Bay Blvd / Urban Arterial Connection (BH21 to BH24 and Supplementary BH1)

Subsurface conditions encountered across bridge abutment area associated with the Moreton Bay Blvd / Urban Arterial connection, comprised mostly of estuarine alluvial sediments consisting soft to stiff silty clay (soft estuarine clays), sandy clay and clayey sands extending to beyond the 2.5 m BGL target depth. BH21 and BH23 encountered weak soils at the target depth and were therefore extended to 4.0 m and 2.5 m respectively. As expected, low strength estuarine alluvium was present near Raff Creek. This material had been encountered during past development works on the southern side of the creek. Low strength estuarine alluvium is expected to be several metres thick, progressively thinning, and reverting to stiffer river terrace alluvial soils further back from the creek.

Standing groundwater was recorded in all boreholes in the vicinity of the Arterial road crossing, ranging from 0.4 m to 1.5 m BGL, which is expected to be influenced by surface water conditions associated with Raff Creek.

Buchanan Road Drainage Reserve (BH25 to BH39)

Subsurface conditions encountered across the drainage reserve extending eastward from Buchanan Road comprised stiff to hard silty clay and sandy clay (river terrace alluvium) to beyond the investigation target depth of 3 m. No standing groundwater was observed in any of investigation sites. Some minor seepage was noted in BH30 at a depth of about 1.7 m BGL, which is likely attributed to a small pocket of confined water created by proximity to a localised drainage pathway. No other groundwater seepage was observed at any other site.

Northern Borrow Area (BH40 to BH55)

Subsurface conditions encountered across the northern Borrow Area comprised stiff to very stiff silty clay (river terrace alluvium) to beyond the investigation target depth of 3.5 m, with some dense clayey sand recorded within the upper 1.0 m in BH40, BH45 and BH46. No seepage or standing groundwater was observed in any of investigation sites.

General Development Earthworks (BH56 to BH85)

Subsurface conditions encountered across the urban and industrial development area can be generally separated by the RL 5 m contour. Subsurface profile in areas above RL 5 m typically comprised weathered residual soil comprising sand, silt and clay, derived from weathering of Landsborough Sandstone underlying the site.

BH56 to BH59 consisted 0.7 m to 1.3 m depth of medium dense to dense sand, underlain by stiff to hard silty clay (flood plain alluvium). BH60 to BH79 and BH83 to BH85 consisted mostly of stiff to very stiff silty clay with interlayered silty sand and sandy clay (river terrace alluvium), and more sandy soils encountered in BH70 to BH76 within the upper 1.5 m.

BH80 to BH82 consisted 0.5 m to 1.2 m depth of flood plain alluvium consisting primarily of medium dense clayey and silty sand, underlain by very stiff to hard residual sandy clay and very dense clayey sand.

Standing groundwater was recorded in boreholes BH71, BH73, BH74 and BH75, ranging from 1.5 m to 1.9 m BGL, and is likely influenced by surface water conditions associated with Raff Creek and other low lying areas. No seepage or standing groundwater was observed across the remaining urban development area.

4.5 Groundwater

Groundwater conditions across the site were variable, typically dependant on local topography. Groundwater was not typically observed across elevated (> RL 2 m) parts of the site, however some minor seepage may be observed as waters become perched or confined within sandy layers, or above and/or below less permeable clay layers following rainfall events.

Lower lying sections of the site typically corresponded with the presence of standing groundwater. These areas are generally associated with estuarine and alluvial deposits and lower lying areas mapped as Quaternary age river terrace alluvium. Groundwater in the vicinity of the proposed wetland areas and Urban Arterial Road Connection is expected to be influenced by surface water conditions associated with Raff Creek, or tidal waters located adjacent to lower sections of the site.

It should be noted that groundwater conditions may vary over time, and seepage may develop at locations where not previously observed, particularly following periods of prolonged or heavy rainfall.

Groundwater samples were able to be recovered from boreholes BH04, BH024 and BH74 only which were tested in the field for ASS related physio-chemical parameters. Results are summarised in Table 2.

Table 2: Summary of Groundwater Monitoring

Parameter	Units	BH04	BH24	BH74
Depth (Standing Water Table)	m BGL	1.0	0.9	1.9
pH	pH unit	4.7	4.5	5.8
Electrical Conductivity	μS/cm	2210	6550	1340
REDOX Potential	mV	105	48	215

Groundwater pH values range from 4.5 to 5.8, indicating groundwater to be naturally acidic. This is typical of natural estuarine and alluvial groundwater environments around the North Harbour development.

EC levels indicate that the groundwater in BH74 is generally fresh (< 1,500 μS/cm), whereas groundwater in BH04 and BH24 is brackish (> 1,500 μS/cm), having been impacted by salinity at some stage. Brackish groundwater may be present either due to entrapment of saline water during soil formation or due to inundation of the site by seawater (e.g. during extreme tidal events). This is considered likely given the proximity of the site to the tidally influenced sections of Raff Creek.

REDOX values of 48 mV to 215 mV indicate that the groundwater conditions tend towards chemically oxidative conditions. This is typical of naturally unconfined alluvial groundwater conditions, where the permeable soil profile and variable groundwater conditions allow the presence and availability of *in situ* oxygen.

4.6 Laboratory Test Results

Site and laboratory investigation methods are described earlier in this report, with the current ASS investigation component generally consisting of a total of 85 boreholes, drilled to a minimum 1 m below to depth of proposed disturbances. This was further supplemented by results from 13 ASS investigation boreholes which had been previously completed to depths of between 2 m and 4.5 m BGL along the proposed alignment.

A breakdown of screen testing and quantitative testing results for each major disturbance area is provided in Section 4.7. An ASS distribution plan has been prepared and is attached as Figure 4 showing the interpreted extent of the major geological units based upon site observations, borehole logs, laboratory test results and geological mapping data.

4.6.1 Field Screen Analysis

A total of 966 samples were recovered and assessed by pH field screen analyses as part of the site assessment. Test results indicate that the soil tested from across the site generally have field pH (pH_F) values which range from about 3.7 to 9. These values indicate that *in situ* soil conditions range from strongly acidic to alkaline across the site.

It was observed that the more acidic samples, and those indicating a higher likelihood of ASS, typically came from Quaternary estuarine sediments (Wetland 3, Wetland 4 and Moreton Bay Blvd/Urban Arterial Crossing) and, to a lesser extent, Holocene river terrace alluvium and Quaternary flood plain alluvium, where these geologies exist (generally at lower topographical locations).

Oxidised pH (pH_{FOX}) testing consistently recorded pH_{FOX} values of less than 3 for samples from varying depths and locations throughout the soil profile, but again with generally higher likelihood for potential ASS to be present within Quaternary estuarine sediments and, to a lesser extent, Holocene river terrace and Quaternary flood plain alluvium located at lower topographical locations.

It is noted that pH screen testing is indicative only and cannot definitively confirm the presence of ASS, nor can it quantify the nature or strength of any acidity present. Further quantitative laboratory testing was therefore carried out on a range of samples in order to assess the strength of any acidity, and to quantify the oxidisable sulfur content present.

4.6.2 Quantitative Laboratory Analysis

Quantitative laboratory analyses from 221 samples using the CRS suite of testing were used in order to quantify the severity and nature of any acidity or potential acidity present in the soil profile. This testing was further supplemented by an additional 41 sample results which were sourced from previous site investigations within and adjacent to Wetlands 1, 2, 3 and Moreton Bay Blvd / Urban Arterial bridge abutment.

Based on the nature of the proposed disturbance, an action criteria of 0.03 %S (18 mol H⁺ per tonne) was adopted for comparison with the combined actual and potential acidity results.

Of the combined 262 samples that underwent quantitative testing, 161 samples recorded a net acidity above 18 mol H⁺ per tonne, indicating the presence of acidic soils at the site.

TAA levels, as a measurement of existing acidity, recorded between < 2 mol H⁺ per tonne and 200 mol H⁺ per tonne, with an average of 60 units. There were 151 of 262 samples having TAA levels higher than 18 mol H⁺ per tonne. Levels of soluble sulfur (S_{KCl}) within these samples exceeded 0.03% for only 40 of the 151 exceeding samples with an average of some 0.05%S (equivalent to 30 mol H⁺ per tonne), indicating that sulfuric based acidity accounts for less than 15% of the total actual acidity recorded. The actual acidity measured is thus predominantly non sulfuric.

Oxidisable sulfur / PASS, as indicated by S_{CR} above 0.03 %, was recorded in only 14 of the 262 samples tested, typically obtained from Quaternary estuarine sediments. In the samples exceeding the action criteria, sulfide concentrations ranged from 0.03% (18 mol H⁺ per tonne) to 3.9% (2400 mol H⁺ per tonne) sulfur.

Some retained acidity, as indicated by S_{NAS} above 18 mol H⁺ per tonne, was also recorded in 21 of the 262 samples tested. Retained acidity was noted to be in the range <10 to 75 mol H⁺ per tonne with an average of some 31 units. It was variably distributed throughout Holocene River Terrace Alluvium and Quaternary flood plain alluvium. It is noted that retained acidity, where present, was noted to exist above standing groundwater, which indicates that the soluble minerals are likely to be relatively well bound *in situ*, as they have not leached out over the thousands of years since their formation.

Quantitative laboratory analysis confirms that some site soils contain levels of ASS which exceed the action criteria. It is noted that all samples which indicated the presence of existing sulfuric acidity / AASS and PASS were typically obtained from Quaternary estuarine sediments and, to a lesser extent, Holocene river terrace alluvium located at lower topographical locations, in close proximity to Raff Creek or Caboolture River.

Existing, non-sulfuric acidity was noted to be variably present throughout soils associated with Holocene age river terrace deposits, Quaternary flood plain alluvium and residual soils associated with Landsborough Sandstone located at higher topographical locations (> RL 3 m).

The quantified levels of AASS, PASS, retained acidity and ANS soil, where present or absent, as indicated by site investigation and soil test results can be used to provide effective characterisation of major works areas, based on level of ASS risk. From this characterisation appropriate management measures can be adopted for individual works, which can be tailored based on the ASS hazard present.

4.7 Spatial Distribution of ASS

Outcomes of the detailed investigation and testing generally found both actual and potential ASS to be present within some alluvial sediments with varying spatial distribution across the site.

As previously discussed, areas of proposed urban development located above RL 5 m typically consist residual Landsborough Sandstone geomorphology with no potential to contain ASS. Potential risk associated with ANS soil in these areas is considered negligible and earthworks may be completed without specific management measures.

Management strategies and controls used to mitigate risk associated with ASS during the proposed development have been based on the level of risk identified in various areas of proposed disturbance. The zones for ASS management have been characterised to ensure that all soils within that zone are appropriately managed based on the characterised ASS hazard.

4.7.1 Wetland 1

Boreholes BH01 to BH03 and TP305 to TP309 are located within and adjacent to Wetland 1.

Soils consisted 0.5 m to 1.2 m depth of alluvial silty and sandy clays underlain by residual sandy clay and clayey sand becoming weathered sandstone.

Of the 21 samples selected for quantitative testing from these locations, 18 samples recorded TAA values above 18 mol H⁺ per tonne indicating the presence of existing acidity. However, the levels of soluble sulfur (S_{KCl}) within the exceeding samples were all less than 0.03%, indicating this to be non-sulfuric acidity (ANS).

No oxidisable sulfur (S_{CR}%) was recorded above the lowest recordable limit of 0.005%, much less the threshold limit defining PASS of 0.03%.

While samples were found to contain some actual acidity, the acid present is not sulfuric in nature and was not derived as a result of oxidation of acid sulfate soil. These soils are therefore characterised as **non-ASS but contains non-sulfuric acidity (ANS)**.

The net acidity recorded across Wetland 1 samples measured between 3 to 120 mol H⁺ per tonne, with an average of 42 mol H⁺ per tonne.

4.7.2 Wetland 2

Boreholes BH04 to BH05 and TP301, TP315, TP316, TP318 and TP319 are located within Wetland 2.

Soils consisted of interlayered alluvial sandy clays at depth ranging from 0.2 m at the north-western end, to beyond the target depth of 2 m BGL at south-eastern end (nearer Raff Creek). The northern end was typically underlain by residual sandy clay grading to distinctly weathered sandstone.

Of the 19 samples selected for quantitative testing from these locations, 17 samples recorded TAA values above 18 mol H⁺ per tonne indicating the presence of existing acidity. Some soluble sulfur (0.04 to 0.06%) and retained acidity (nil to 79 mol H⁺ per tonne) was recorded in samples originating from the southern end of the wetland, indicating the presence of some AASS and previous ASS exposure nearer Raff Creek.

No oxidisable sulfur (S_{CR}%) was generally recorded above the lowest recordable limit of 0.005%, much less the threshold limit defining PASS of 0.03%.

These soils are therefore characterised as **AASS with some retained acidity but contains no PASS**.

The net acidity recorded across Wetland 2 samples measured between 4 to 200 mol H⁺ per tonne, with an average of 90 mol H⁺ per tonne.

4.7.3 Wetland 3

Boreholes BH06 to BH07 are located within Wetland 3, with supplementary test pits TP334 and TP336 being located approximately 30 m to the south.

Soils consisted of interlayered firm to stiff silty clay, clayey silt and sandy clay (estuarine / river terrace alluvium).

Of the 10 samples selected for quantitative testing from these locations, 9 samples recorded TAA values above 18 mol H⁺ per tonne indicating the presence of existing acidity. Some soluble sulfur (0.03 to 0.04%) and retained acidity (nil to 22 mol H⁺ per tonne) was recorded in samples, indicating the presence of some AASS and previous ASS exposure nearer Raff Creek.

One sample from TP336 was found to contain PASS which recorded 0.06 %, however this sample was obtained from upper surface soils (0.0 to 0.25 m BGL) and is expected to have been affected by estuarine alluvial conditions nearer Raff Creek. No oxidisable sulfur (S_{CR}%) was otherwise recorded above the lowest recordable limit of 0.005%, much less the threshold limit defining PASS of 0.03%.

These soils are therefore characterised as **AASS with some retained acidity but contains no PASS**.

The net acidity recorded across Wetland 3 samples measured between 9 to 212 mol H⁺ per tonne, with an average of 82 mol H⁺ per tonne.

4.7.4 Wetland 4

Boreholes BH08 to BH12 are located within Wetland 4.

Soils consisted interlayered firm to very stiff clayey silt and silty / sandy clay (estuarine / river terrace alluvium) to beyond the investigation target depth of 2 m.

Of the 11 samples selected for quantitative testing from these locations, 10 samples recorded TAA values above 18 mol H⁺ per tonne indicating the presence of existing acidity. Some soluble sulfur (0.03 to 0.07%) and retained acidity (nil to 28 mol H⁺ per tonne) was recorded in samples, indicating the presence of some AASS and previous ASS exposure.

No oxidisable sulfur (S_{CR}%) was generally recorded above the lowest recordable limit of 0.005%, much less the threshold limit defining PASS of 0.03%.

These soils are therefore characterised as **AASS with some retained acidity but contains no PASS**.

The net acidity recorded across Wetland 3 samples measured between 12 to 141 mol H⁺ per tonne, with an average of 61 mol H⁺ per tonne.

4.7.5 Wetland 5

Boreholes BH13 to BH20 are located within Wetland 5.

Subsurface conditions encountered across the majority of the Wetland 5 area comprised mostly of stiff to hard silty / sandy clay extending to beyond 3.5 m BGL (river terrace alluvium), with some loose to medium dense clayey sand (estuarine alluvium) encountered below 2.5 m BGL at the north-eastern end nearer the bank of the Caboolture River (BH20). It is noted that surface elevation at BH20 was several metres lower than the remaining wetland area.

Of the 27 samples selected for quantitative testing from Wetland 5, only 6 samples recorded TAA values above 18 mol H⁺ per tonne indicating the presence of some existing acidity. Soluble sulfur was generally not present, but where present, existing in low values and did not correspond to significant levels of actual acidity.

Oxidisable sulfur (S_{CR}%) exceeding 0.03 % was recorded in estuarine alluvium present below 1.5 m BGL in BH20 but was otherwise not recorded above the lowest recordable limit of 0.005% in any other samples across the remainder of the Wetland 5 area.

The majority of Wetland 5 is characterised as **non-ASS but contains non-sulfuric acidity (ANS)**, with the area in the vicinity of BH20 (adjacent Caboolture River) characterised as **containing AASS / PASS**.

The net acidity recorded across the majority of Wetland 5 samples measured between 3 to 120 mol H⁺ per tonne, averaging 15 mol H⁺ per tonne. The soils in the vicinity of BH20 measured between 18 to 552 mol H⁺ per tonne, averaging 218 mol H⁺ per tonne.

4.7.6 Moreton Bay Blvd / Urban Arterial Connection

Boreholes BH21 to BH24 are located within the proposed abutment works area associated with the Moreton Bay Blvd / Urban Arterial Connection. Supplementary borehole BH1 is located on the southern side of Raff Creek, where some abutment works have been previously completed.

Subsurface conditions encountered across the bridge abutment area comprised mostly of estuarine alluvial sediments consisting soft to stiff silty clay (soft estuarine clays), sandy clay and clayey sands extending to beyond the 2.5 m BGL target depth. These soft estuarine clays are generally water logged and commonly contain ASS.

Of the 15 samples selected for quantitative testing from the proposed abutment works area, 13 samples recorded TAA values above 18 mol H⁺ per tonne indicating the presence of existing acidity. Soluble sulfur (<0.02 to 0.14%) and retained acidity (nil to 37 mol H⁺ per tonne) was recorded in samples, indicating the presence of AASS and previous ASS exposure.

Oxidisable sulfur (S_{CR}%) exceeding 0.03 % was recorded in 9 of the 15 samples generally increasing in strength with depth from surface, within the estuarine clays.

The proposed abutment works area associated with the Moreton Bay Blvd / Urban Arterial Connection is characterised as **containing AASS / PASS**.

The net acidity recorded across samples collected from the proposed abutment works area measured between 36 to 2665 mol H⁺ per tonne, averaging 562 mol H⁺ per tonne.

The net acidity observed within the soft estuarine clays consists of a combination of AASS and PASS. Should this material be actively dewatered or placed in a location where material is exposed to atmospheric conditions over a prolonged period without management, it is likely that oxidation of pyritic fines would occur, and sulfuric acid would be generated and/or mobilised.

This section of the proposed works represents the most significant hazard, due to the presence and severity of ASS. Specific groundwater and ASS management measures pertaining to disturbance of low-strength estuarine clay within this section are defined in Section 5.

4.7.7 Buchanan Road Drainage Reserve

Boreholes BH25 to BH39 are located within the Buchanan Road Drainage Reserve.

Soils consisted silty clay and sandy clay (river terrace alluvium) to beyond the investigation target depth of 3 m. No standing groundwater was observed in any of investigation sites.

Of the 43 samples selected for quantitative testing from these locations, 34 samples recorded TAA values above 18 mol H⁺ per tonne indicating the presence of existing acidity. Some soluble sulfur (0.03 to 0.07%) and retained acidity (nil to 38 mol H⁺ per tonne, typically present at the eastern end) was recorded in samples, indicating the presence of some AASS and previous ASS exposure.

No oxidisable sulfur (S_{CR}%) was recorded above the lowest recordable limit of 0.005%, much less the threshold limit defining PASS of 0.03%, with the exception of one sample. BH31 recorded an S_{CR} of 0.032 %, marginally exceeding 0.03 % action criteria. This is generally counterintuitive to the occurrence of ASS, as the sample was obtained from near surface (0.0 to 0.25 m BGL) where any PASS would likely have been oxidised under natural conditions, and is considered a tolerable outlier for soil characterisation purposes.

These soils are therefore characterised as **AASS with some retained acidity but contains no PASS**.

The net acidity recorded across the drainage reserve samples measured between 6 to 205 mol H⁺ per tonne, with an average of 54 mol H⁺ per tonne.

4.7.8 Northern Borrow Area

Boreholes BH40 to BH55 are located within the northern borrow area.

Soils consisted stiff to very stiff silty clay (river terrace alluvium) to beyond the investigation target depth of 3.5 m, with some dense clayey sand recorded within the upper 1.0 m in BH40, BH45 and BH46 nearer Caboolture River. No seepage or standing groundwater was observed in any of investigation sites.

Of the 55 samples selected for quantitative testing from these locations, 12 samples recorded TAA values above 18 mol H+ per tonne indicating the presence of some existing acidity variably distributed across and throughout the soil profile. Levels of soluble sulfur (S_{KCl}) within the exceeding samples were all less than 0.02%, indicating this to be entirely non-sulfuric acidity (ANS). The strength of the existing acidity measured between < 3 to 38 mol H+ per tonne, with an average of 12 mol H+ per tonne.

No oxidisable sulfur ($S_{CR\%}$) was recorded above the lowest recordable limit of 0.005%, much less the threshold limit defining PASS of 0.03%.

While samples were found to contain some actual acidity, the acid present is not sulfuric in nature and was not derived as a result of oxidation of acid sulfate soil. These soils are therefore characterised as **Non-ASS containing minor non-sulfuric acidity (ANS)**.

It is noted that the strength of the existing non-sulfuric acidity is less than 50 mol H+ per tonne (on average less than 18 mol H+ per tonne) and is therefore not likely to create negligible impact if disturbed. Excavation of materials within the borrow area may therefore be completed without need specific management measures, this includes the use of fill materials sourced from this area.

4.7.9 General Development Earthworks

Boreholes BH56 to BH85 are spread across the general urban development area, being located below RL 5 m. Proposed works across these areas are expected to typically consist of bulk filling activities and minor excavation for stripping of topsoil and installation of civil infrastructure. Standing groundwater was recorded in boreholes BH71, BH73, BH74 and BH75, ranging from 1.5 m to 1.9 m BGL, and is likely influenced by surface water conditions associated with Raff Creek and other low lying areas. No seepage or standing groundwater was generally observed across the remaining urban development area.

Subsurface conditions across proposed filling areas typically consists medium dense or denser sands, and/or firm or stiffer clay subsoils with groundwater generally not present. These being generally overconsolidated river terrace of flood plain alluvium and/or residual soil, the risk of acid migration through displacement of these soils, due to placement of fill loads is non-existent.

Of the 61 samples selected for quantitative testing from investigation locations, 33 samples recorded TAA values above 18 mol H+ per tonne indicating the presence of some existing acidity variably distributed across and throughout the soil profile.

Some minor soluble sulfur (0.03 to 0.04%) and retained acidity (nil to 35 mol H+ per tonne) was recorded in BH68, BH69, BH84 and BH85, located adjacent (and in close proximity to) the Buchanan Rd Drainage Alignment, however the majority of remaining fill areas contained no soluble sulfur or retained acidity. These boreholes are of similar topography and soil conditions to the Buchanan Rd Drainage alignment and will be similarly characterised and managed.

No oxidisable sulfur ($S_{CR\%}$) was recorded above the lowest recordable limit of 0.005%, much less the threshold limit defining PASS of 0.03% in any samples tested.

The soils in the vicinity of BH68, BH69, BH84 and BH85 are therefore characterised as **AASS with some retained acidity but contains no PASS**. The remaining urban development area is characterised as **Non-ASS containing non-sulfuric acidity (ANS)**.

The net acidity recorded across the urban development area samples measured between 2 to 158 mol H+ per tonne, with an average of 33 mol H+ per tonne.

Common indicators of ASS in acidic environments raise doubts as to the mobility of the measured acidity present within overconsolidated river terrace alluvium within the drainage reserve area, and it is thus

expected that much of the acidity present in these formations is likely to be tightly bound to the soil structure and is not likely to be readily mobile.

4.8 ASS Risk Characterisation

Based on the proposed disturbance of Quaternary Estuarine Sediments during construction of the Moreton Bay Blvd / Urban Arterial bridge abutment, a liming rate of up to 178 kg per m³ has been calculated for the treatment of the disturbed soils and management of AASS and ANS soil risks associated with Quaternary age river terrace and flood plain alluvium. It is expected that these works will require more than 25 tonnes of agricultural lime for neutralisation. Thus, the proposed works are categorised as requiring an “**extra high level**” of treatment, per the categorisation guide set out in the *Queensland Acid Sulfate Soil Technical Manual*.

Whilst it is noted that the project falls within the extra high treatment category, it is reasonably expected that the ASS hazard associated with these works can be appropriately managed through application of conventional environmental management strategies for ANS, AASS and PASS, which have been already successfully implemented for development works associated with the North Harbour residential development.

Management strategies and controls used to mitigate risk associated with ASS during the proposed development have been based on the level of risk identified in various areas of proposed disturbance and are described in Section 5.

5.0 ASS MANAGEMENT PLAN

The primary objective of this management plan is to provide a framework to allow the proposed works to proceed without adverse environmental impacts related to the disturbance of ASS, and other forms of acidic soil. To successfully achieve this objective, the following strategies will be implemented:

- Minimisation of the spatial and temporal disturbance of areas where ASS may exist, and avoidance of significant changes to any areas outside the civil easement;
- Mitigation of risk associated with ASS present in disturbed soil via neutralisation of disturbed ASS and ANS soil (where potential risk exists), and successful verification testing (on ASS only);
- Containment, testing and treatment (where necessary) of any water collected during the excavation and/or during the treatment processes; and
- Limitation of any alteration to the existing groundwater conditions and appropriate treatment of any collected groundwater before re-use, offsite discharge or disposal.

5.1 Contractor Responsibilities

Any Contractor/s responsible for soil disturbance at the site shall conduct operations in accordance with this ASSMP. Prior to the commencement of works, the Contractor/s shall provide the following information to the Principal:

- Contractor's Environmental Policy.
- Program for Environmental Training of relevant staff.
- Names and responsibilities of specific staff members involved in the supervision of the implementation of this ASSMP.
- The name and qualification of a suitably qualified ASS specialist to be engaged by the Contractor.
- A site-based management plan (SBMP) for the proposed earthworks program including management strategies and controls relevant to key environmental elements.
- A schedule of proactive site inspections to identify any environmental issues and plan necessary remedial actions, and to confirm the ongoing success of any maintenance mechanisms.

The Contractor shall incorporate the requirements of this ASSMP into subsequent construction and environmental management planning. In addition to the requirements of this ASSMP, the Contractor shall also implement appropriate management strategies for mitigation of erosion and sediment transport and stormwater quality on site. Management strategies and controls must be in accordance with International Erosion Control Association's Best Practice Management Guidelines.

Whilst undertaking any works at the site, the Contractor/s shall maintain appropriately detailed records in the following areas:

- Results of any ASS testing as required by this ASSMP;
- Location of soil during the treatment process, including the source of the soil and its final destination, and the rates / total quantities of ameliorant (aglime) added to the soil requiring neutralisation;
- A register of all agricultural lime delivered to site and used on site for the purpose of soil neutralisation, including the volumes of soil treated and the treatment rate.
- A daily log of soil excavation, treatment and relocation activities shall be kept, including locations, relevant zones from the liming application rate plan in this ASSMP, horizons encountered, any observations pertinent to ASS, PASS and ANS management, stockpile dates, approximate position of treated soil placement on site, liming actions and rates, any samples taken and tested and any other information relevant to the treatment and handling of soils and ASS considered necessary by the suitably qualified ASS specialist.
- Results of surface and ground water monitoring as required by this ASSMP and/or the Contractor's SBMP; and
- Incidents, near incidents or complaints related to the performance of ASSMP requirements during the works.

Any management issues relating to the results of the monitoring of standing water levels, pH and/or acid generation in standing water shall be dealt with by the Contractor's SBMP which shall be prepared in accordance with requirements outlined in this ASSMP.

5.1.1 Maintenance of Controls

All environmental protection measures are to be operated in a proper and efficient manner and maintained in effective condition, including undertaking checks after rainfall events that may adversely impact their effectiveness.

5.1.2 Training and Orientation

A training and induction program shall be conducted for all Contractors staff involved in the excavation, transport and handling of earth or earthworks on the site. Sessions will be conducted prior to the commencement of earthworks and at other such regular intervals as required to ensure staff are fully aware of the requirement for field management of ASS and associated waters, the management strategies to be implemented, and their roles and responsibilities in achieving the desired management outcomes.

The Contractor is expected to engage the services of a Geotechnical Consultant to provide advice on various geotechnical aspects of the proposed works, including various forms of quality assurance testing. It is expected that the Geotechnical Consultant can provide advice to the Contractor with regard to the presence and location of various geological boundaries where any ambiguity exists. Should the Geotechnical Consultant provide specific ASS related advice, they must hold the relevant experience and qualification to provide such advice.

5.1.3 Management of Non-Conformance Issues

The Contractor shall assume responsibility for implementation of the ASSMP on site. Where site inspection or associated monitoring highlights an operational condition that does not comply with the requirements of the ASSMP, the breach must be reported to the project Superintendent or Principal within 24 hours of occurrence.

It is the project Principal's responsibility to inform the relevant administering authority, where necessary, within the required timeframes.

The Contractor/s shall always seek a timely resolution with respect to any complaints received in relation to the environmental performance of the works at the site. The standard procedure for dealing with complaint resolution shall be included in the Contractor's SBMP and must involve the implementation of corrective actions to address any non-conformance issues.

All environmental incidents and non-conformances must be recorded in an Environmental Incident Register. The register must be made available to the administering authority upon request.

5.2 Management of Disturbed Material

Material containing ASS, or large volumes of ANS soil, which are excavated or otherwise disturbed as part of development works, will be treated to neutralise the net acidity present, prior to reuse onsite.

The assessment of results, as discussed in Section 4, has characterised the site soils as either:

- Soil containing AASS / PASS,
- Soil containing AASS / Retained Acidity Only (No PASS)
- Non-ASS, but contains non-sulfuric acidity (ANS) requiring treatment, and
- Non-ASS, containing low non-sulfuric acidity (ANS) requiring no treatment.

The distribution of these acidic soils on the site is illustrated in Figure 4.

Methodology and instruction on adequate treatment rates for these soils are discussed below. The treatment regime that must be adopted for the treatment of all soils excavated from areas defined as

containing PASS/AASS or AASS only is set out in Section 5.2.1. Treatment of soil excavated from areas shown to contain only ANS shall be undertaken as set out in Section 5.2.2.

5.2.1 Treatment Methodology for ASS

Prior to the commencement of any excavation works in areas shown in Figure 4 as containing AASS or PASS, a treatment area (or areas) must be adequately prepared for the treatment of excavated materials.

Treatment area/s must allow for the stockpiling of excavated material during the treatment and verification process. The number and size of these treatment areas will be governed by the following factors:

- the total volume of material being excavated and treated,
- the expected rate at which the material is to be excavated, treated and verified,
- the available space within the construction site for treatment areas, and
- the intended final destination of the treated material.

Excavation of material shall not commence until sufficient space in an appropriate treatment area/s is available, firstly to treat the excavated material and then store the treated material whilst verification testing is completed.

Treatment areas may be temporary, or they may be located at the final intended destination of excavated material. The latter is appropriate in this case as the excavated materials are to be placed over a typically clayey soil subgrade which will have been mechanically compacted resulting in low permeability.

The treatment area/s shall consist of a near level area effectively controlled by drainage or earthen bunds (of non-ASS material or previously treated and verified material), placed to prevent the escape of acidic leachate or runoff from untreated/stockpiled material during the treatment process. The drainage and bunding must also exclude stormwater from areas outside the treatment area from entering the treatment area.

Where earthen bunds are used to capture and retain any leachate or runoff, the bunds must be of sufficient size to retain a 24 hour storm event with a 1 in 5 year annual recurrence interval (ARI). The storage volume within the bunds must also include an allowance for the storage of stockpiled ASS.

Where soils are treated at their final destination, controlled drainage shall be used to capture and retain any leachate or runoff from the treatment area and deliver it to a retention basin. Treatment areas must be banded to prevent uncontrolled discharge and to direct runoff into a drainage system.

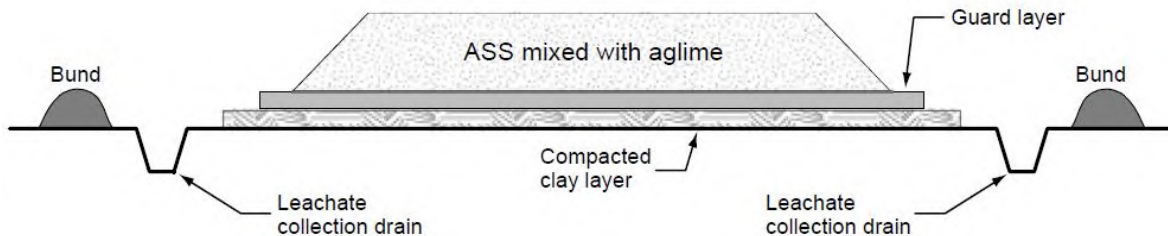
The contractor shall ensure that the permeability of the base of each treatment area is sufficiently low to reduce the likelihood that leachate from the treatment area making its way into the groundwater at the site. Soils on the base of the treatment area should have a permeability less than 1×10^{-7} metres per second. Lining the base of a treatment area with compacted clay may be required if the existing base consists of sandy soil.

Appropriate erosion and sediment control measures must be implemented in accordance with the International Erosion Control Association's Best Practice Guidelines, which should adequately contain and control runoff from all areas of land used for the treatment of ASS. All runoff generated from the ASS treatment area(s) (including dewatering and excavation activities) must be contained, tested and treated (if necessary) prior to discharge or re-use onsite. Treatment basins must be appropriately sized to contain and treat runoff in accordance with current industry standards. Drainage and or diversion works must also exclude stormwater from areas outside the treatment areas from entering the treatment basin / banded area.

For the treatment of ASS excavated from the trenching required for the construction of civil infrastructure, the use of the treatment pad may be more appropriate. As backfilling normally progresses closely behind the excavation and pipe installation, it is likely that the results of validation testing of the treated backfill will not be available prior to backfill placement. In order to allow the works to progress smoothly, a stockpile of treated and validated soils should be kept on site for immediate use as trench backfill. The stockpile can be replenished with the treated materials as the results of successful validation treatment come available. Regardless of the proposed construction method, only validated backfill shall be replaced in the trenches by the Contractor.

If the selected treatment areas are to be the final placement destination of the excavated material, geotechnical advice should be sought as required regarding the construction of the treatment areas. This will ensure that the treatment areas comply with the appropriate requirements regarding placement of structural fill at the site.

An example of a typical treatment pad construction is provided as Text Figure 6 below.



Text Figure 3: Example of controlled ASS treatment pad

Regardless of whether temporary or permanent treatment areas are selected, the distance between the excavation area and treatment area is to be kept as short as practical.

Prior to the placement of any excavated material containing AASS / PASS within a treatment area, the base of the treatment area is to be pre-treated with agricultural lime at a rate of 8 kg/m² for every metre or part thereof in height of material to be stockpiled or placed on the site.

ASS shall be stockpiled for no more than 48 hours prior to neutralisation.

All treatment areas are to be identified by signage in order to allow for the tracking of material through the excavation, treatment and verification process.

Lime treatment will be completed at the rates specified in Table 3 in Section 5.2.3. In order to achieve successful treatment, it is critical that the appropriate quantity of lime is thoroughly mixed with the excavated material. Excavated material should be spread in layers not greater than 300mm in thickness and the appropriate quantity of lime applied before thorough mixing of the layer. Granular soils are typically easier to treat as the mixing process can be achieved more readily. In the case of cohesive soils (e.g. clays), effective mixing of the layer will be more difficult. However, techniques such as rotary hoeing or disc ploughing can be used to produce the desired mixing. Once the previous layer has been mixed, further layers may be added as required. Caution is advised with respect to total volumes treated prior to verification testing. This will be particularly relevant at the start of the excavation or until experience is gained with respect to the level of mixing which results in successful verification testing.

5.2.2 Treatment of Acidic Non-Sulfuric Soil (ANS)

To mitigate risk associated with existing acidity observed in ANS soil, disturbed ANS soil containing acidity exceeding 50 mol H⁺ per tonne will be treated with fine grained agricultural lime to neutralise any potential leachate from the excavated materials.

As the risk posed by ANS soils is not as significant as ASS, neutralisation may be undertaken through placement of guard layers within trench backfill, without the need for thorough mixing of treated soil, the inclusion of safety factors in liming rate calculations, or the use of a specifically contained treatment areas.

Furthermore, ANS soils exist in an environment that is naturally acidic. The use of excessively high liming rates has the potential to alter that environment. The recommended liming rates have thus been calculated to neutralise any possible acid leachate without increasing the pH of the existing environment.

Fine grained agricultural lime will be placed as guard layers between soil layers of ANS fill. The guard layers must be placed at not more than 500 mm depth intervals within the fill profile.

Lime treatment will be completed at the rates specified in Table 3 in Section 5.2.3.

Runoff and potential leachate from treatment and excavation areas must be controlled and managed to mitigate potential effects on ground or surface waters. This should be undertaken in conjunction with an approved Erosion and Sediment Control Plan with all runoff diverted via sediment basins on the site.

Verification testing for confirmation of effective treatment of ANS soil is not necessary. Verification will instead be demonstrated by recording lime delivery and use in a lime register. The register will be maintained by the Contractor and will provide an account of all lime used for the treatment of ANS (and ASS) on the site. It must record the date, quantity, delivery docket number and the area stored for all lime deliveries to the site. The register must also record the area where ASS / ANS is placed and treated, the type and source of the soil, the lime application rate in kilograms lime per square metre and the total quantity of lime used.

The register as specified shows the quantity of lime imported and the quantity of lime used. The register must also show the quantity of lime stockpiled on the site at any time. It is the Contractor's responsibility to check the lime register on a weekly basis and confirm that the quantity of lime stockpiled on the site is in accordance with the quantities shown in the lime register.

The lime register must be available for inspection by the suitably qualified ASS consultant on the project, Superintendent and administering authorities on request, to confirm that appropriate treatment has been completed.

5.2.3 Recommended Liming Rates

ASS distribution with regard to areas of disturbance is illustrated in Figure 4 attached at the end of this report. Recommended lime treatment rates for each characterised section are detailed in Table 3 over page.

These rates assume the use of fine grained agricultural lime with a purity of not less than 90%, a soil bulk density of 1.7 tonnes per cubic metre, and a factor of safety of 1.5 (included for ASS materials only), to allow for incomplete mixing and the reactivity of the lime.

These rates are recommended rates only and are based on the results of the laboratory analysis performed on the samples collected during site investigations. The applicability of these rates to the broader scale of the entire excavation is a function of the degree to which the samples taken during the investigation are representative of the material to be excavated as a whole.

Table 3: Recommended Lime Application Rates

Works Area	ASS Risk Characterisation	Liming Rate
Wetland 1	Non-ASS, but contains non-sulfuric acidity (ANS) requiring treatment	9 kg/m ³
Wetland 2	Soil containing AASS / Retained Acidity Only (No PASS)	23 kg/m ³
Wetland 3	Soil containing AASS / Retained Acidity Only (No PASS)	18 kg/m ³
Wetland 4	Soil containing AASS / Retained Acidity Only (No PASS)	13 kg/m ³
Wetland 5 (Majority)	Non-ASS, but contains non-sulfuric acidity (ANS) requiring treatment	3 kg/m ³
Wetland 5 (Northern End)	Soil containing AASS / PASS	59 kg/m ³
Moreton Bay Blvd / Urban Arterial Connection	Soil containing AASS / PASS	178 kg/m ³
Buchanan Road Drainage Reserve	Soil containing AASS / Retained Acidity Only (No PASS)	13 kg/m ³
Borrow Area	Non-ASS, containing low non-sulfuric acidity (ANS) requiring no treatment	* N/R
General Development Earthworks (Located < RL 5 m)	Non-ASS, but contains non-sulfuric acidity (ANS) requiring treatment	7 kg/m ³

* N/R Existing acidity typically < 50 mol H+ per tonne (Average < 18 mol H+ per tonne) no treatment required.

Records of lime delivery and usage at the site will be maintained by the contractor to help verify that appropriate amounts of lime have been used during construction.

Agricultural Lime Availability

The contractor must ensure that a stockpile of at least 10 tonnes of fine grained agricultural lime be kept at the treatment site during the construction period. This stockpile will be stored in a fashion so as to prevent the unplanned release of the lime into the environment, through erosion or runoff.

Lime delivery receipts must be kept and filed by the contractor and used to confirm the appropriate volumes of lime have been used for the soil treatment during the works.

5.2.4 Verification Testing

Verification testing shall be carried out on all treated ASS material to confirm successful treatment has been undertaken. Verification testing will not be required for management associated with ANS materials.

Samples for verification purposes shall be randomly taken from the treated material and tested to confirm that the treatment has been successful. Each verification sample must be taken by mixing material from no less than 6 locations (including at depth) within the treatment area.

As noted above, plant may be required for the collection of these verification samples, particularly if stockpile heights are large. It is recommended that verification samples are collected by an independent testing authority and forwarded to the testing laboratory.

Turnaround times for verification testing vary from laboratory to laboratory and this delay (along with sample freight times) should be factored into the construction program. It is further recommended that an estimate of standard turnaround times is requested from the selected testing laboratory prior to the commencement of works at the site. It may be prudent to utilise rotating treatment areas to allow for the verification testing to be completed without impacting the construction process.

The frequency of verification testing is set at one sample per 500 cubic metres of treated material.

This verification sampling frequency has been selected to balance the potential risk associated with differential availability of the soil's inherent neutralising capacity in the laboratory testing environment in comparison to field conditions.

Acceptance Criteria

The laboratory test regime for validation testing shall involve the measurement of pH, total acidity (the sum of actual, potential and residual acidity) and acid neutralising capacity (ANC). Where the pH post treatment is greater than 6.0 and the ANC is not less than 1.5 times the total acidity, then the validation shall be deemed successful.

It is noted that the post treatment pH criteria is less than that recommended in the Queensland ASS Management Guidelines but is considered appropriate given the natural acidity of the environment.

If any sample in a group of five consecutive samples fails to meet the acceptance criteria, then it may be deemed to pass providing:

- The ANC is greater than the total acidity and all other samples in any five consecutive samples containing the failed sample have met the acceptance criteria; Or
- There is not more than two failed samples in any five consecutive samples containing the failed sample and the average ANC is not less than 1.5 times the average total acidity for any five consecutive samples.

Where a sample fails verification and does not meet the criteria above, re-treatment of the area represented by the sample will be required prior to another series of verification testing. This retreatment and retesting procedure must be repeated until successful treatment has been verified. The requirement for retreatment and retesting may lead to delays in construction if sufficient treatment areas are not available prior to the commencement of the excavation works.

5.3 Management of *In-situ* ASS

5.3.1 Groundwater & Dewatering

Groundwater conditions across the site were variable, usually being dependant on local topography. Groundwater was not typically observed across elevated (> RL 2 m) parts of the site, however some minor seepage may be observed as waters become perched or confined within sandy layers, or above and/or below less permeable clay layers following rainfall events.

Lower lying sections of the site (Moreton Bay Blvd / Urban Arterial Connection and eastern side of the Urban Development Area) typically corresponded with the presence of standing groundwater. Groundwater in

these areas is expected to be influenced by surface water conditions associated with Raff Creek, or tidal waters located adjacent to lower sections of the site.

Lowering of the groundwater table for the purpose of construction in areas where PASS has been identified has the potential to allow oxidation of *in situ* pyritic material. Such oxidation would cause the generation of sulfuric acid *in situ*. This process is irreversible and can cause widespread environmental problems and damage to any infrastructure which may be in contact with the acidic groundwater. Such areas (where PASS has been identified) include the Moreton Bay Blvd / Urban Arterial Connection and eastern end of Wetland 5.

The majority of urban development is anticipated to involve excavation and bulk filling, in areas where groundwater was not encountered. However in isolated cases, some localised dewatering may be required for construction associated with civil infrastructure. Small scale dewatering may be undertaken to facilitate construction of civil infrastructure and minor structures without risk in areas where PASS has not been encountered.

Where dewatering in areas containing AASS or PASS is required, the following management strategies must be undertaken during periods of dewatering:

- Periods of active dewatering without the use of groundwater recharge and management measures shall be limited to a total period of 3 days. At which time pre-existing ground and water levels should be fully reinstated and allowed to recover for a period of no less than 1 week.
- Where groundwater dewatering is required for periods longer than 3 days, active management of the impacts of dewatering must be utilised to limit oxidation of *in situ* PASS. Water pumped from the excavation will be adjusted to a neutral pH and used to maintain the surface soils within 10 metres of the excavation in a moist condition by irrigation to restrict oxygen diffusion through the soil. Alternatively, recharge trenches may be excavated around the perimeter of the excavation to maintain the groundwater levels away from the excavation and restrict the cone of groundwater depression to the immediate vicinity of the excavation.
- Depth of dewatering shall be limited to within 1 metre of the base of the required excavation.
- Quality of groundwater inflows into excavations shall be monitored to ensure *in situ* acidification is not occurring. The monitoring shall involve pH testing of inflows daily during dewatering. It should be noted that groundwater in the area is expected to be somewhat naturally acidic (pH 4.5-6.5).

5.3.2 Fill Placement

Where fill is placed over compressible soils, the load imposed by the fill can cause settlement in the compressible soils. This leads to a short term rise in water table levels and potential for the expulsion and leaching of groundwater into the receiving environment. Where the compressible soils are ASS, then the leachate may be acidic with associated high levels of dissolved metals.

Strength measurements were taken on subgrade soils at investigation sites during the field investigations. The measurements allowed the soil consistency to be recorded on all borehole and test pit logs.

The likely loads associated with fill placement and the construction of structures on the site are between 40 and 50 kPa. The subgrade soils in most boreholes have a bearing capacity far in excess of the likely load and therefore no settlement is likely to occur.

However, a zone of weaker soils (soft estuarine clay) was encountered in BH21, BH22, BH23 and BH24 associated with the Moreton Bay Blvd / Urban Arterial Connection abutment area with consistency measured between 20 and 90 kPa. Some minor settlements in that area may occur. The magnitude of the settlements has been assessed on the basis of typical consolidation parameters for similar soils in similar environments to be 40 to 80 mm. Settlements of this magnitude will have no significant impact on groundwater levels nor will there be any significant expulsion of pore water.

At all other sites, the bearing capacity of the subgrade was assessed to be in excess of 60 kPa but generally in excess of 200 kPa.

5.3.3 Mounding of Groundwater

Where fill soils are placed over relatively flat areas (where standing groundwater exists), mounding of the groundwater is possible. This can lead to the discharge of acidic or contaminated leachate into the adjacent waterways. This impact can occur where the fill materials consist of low permeability materials and the rate of infiltration exceeds the rate of discharge from the aquifer.

For this project, the fill materials consist of compacted low permeability clays and sandy clays with measured permeabilities less than 10^{-8} metres per second. Furthermore, much of the surface will be covered by housing and roads which will shed water.

As the surface infiltration will decrease and there will be no change to the hydraulic conductivity of the underlying aquifer materials, then no mounding of the groundwater is likely and the risk is considered insignificant.

5.3.4 Shear Failure

Where soft subgrade soils are present, shear failure can occur at the perimeter of the fill platform causing the subgrade soils to heave upwards. This can change soil environment in the immediate vicinity from anaerobic to aerobic and allow the oxidation of PASS if present. For this site, the soil strength was measured during the ASS investigation and recorded in the borehole and test pit logs. The investigation indicated that all soils on the site are competent to support the fill loads and that no heave will occur within or around the perimeter of the fill platform.

6.0 WATER QUALITY MANAGEMENT

For each stage of construction, a detailed Erosion and Sediment Control Plan will be prepared by the Contractor which must be implemented to manage stormwater and sediment control onsite. The plan will detail the stormwater control, water quality objectives and erosion and sediment control measures to be adopted.

Erosion and sediment control measures should be implemented in accordance with the International Erosion Control Association's Best Practice Guidelines and must incorporate the water quality objectives and management requirements outlined of this management plan.

Any stormwater release, such as from sedimentation basins, must comply with Table 4 Site Water Quality Release Criteria.

6.1 Construction Water Quality

All runoff generated from the ASS treatment area(s), including excavation activities must be contained, tested and treated (if necessary) prior to discharge or re-use onsite. The treatment basin(s) or earthen containment bunding must be constructed to industry regulation standards and must be of a size not less than that capable of accommodating a 24 hour storm event with an ARI of 1 in 5 years plus sediment storage volume.

Uncontrolled discharge of water from excavations, ASS treatment areas or exposed works areas will not be allowed to occur. Only waters meeting the release criteria specified in Table 4 may be discharged to the receiving environment. Automated dosing of contained stormwater should be undertaken to ensure specified release criteria is achieved, even when the site may be unmanned. Preference will be given to reuse of contained site water over discharge, however it is anticipated that some discharge of surface waters will be necessary during construction.

Potential site water reuses include, but are not limited to:

- groundwater recharge;
- dust suppression;
- conditioning of structural fill or road materials to assist in compaction; or
- watering of vegetation.

The Contractor will be responsible for ensuring relevant water quality criteria are met and are appropriately recorded and reported. This is consistent with general site control requirements for erosion and sediment control during construction.

If discharge from the site is required, performance criteria detailed in Table 4 (below) must be met prior to release. The Contractor will be responsible for ensuring relevant water quality criteria are met prior to discharge.

Table 4: Water Quality Release Criteria

Indicator	Release Limit	Criteria Type	Monitoring Frequency
pH	6.0 to 8.0 ^{1.}	Range	Once prior to, and at least hourly during release.
Turbidity	To be determined by site specific correlation testing ^{2.}	Maximum	Once prior to, and at least hourly during release.
Total Suspended Solids	< 50 mg/L	Maximum	Once prior to release.
Dissolved Oxygen	85% to 110 % saturation	Range	Once prior to release.
Dissolved Aluminium	0.2 mg/L	Maximum	Once prior to release.
Dissolved Iron	0.3 mg/L	Maximum	Once prior to release.
Hydrocarbons	No visible sheen or odour in release waters		At all times during any release
Litter/Gross Pollutants	No visible litter washed from the site nor any unsightly flocs deposited in waters downstream of any discharge point		At all times during any release

Notes:

1. As releases of treated water occur to Raff Creek catchment which may host acid sensitive fauna such as acid frogs, a lower level of release pH of 6.0 has been adopted based on background pH levels.
2. Potential correlation may be investigated between turbidity and suspended solids concentration. Where a correlation coefficient of 0.9 or greater is demonstrated based on quality assured sampling and analysis, the corresponding value of turbidity may be used as an operational indicator of suspended solid compliance. Correlation results must be confirmed and approved by the Superintendent prior to implementation by the Contractor. Suspended solid concentrations must still be completed but may be undertaken together with other laboratory analyses.
3. Water quality release limits requiring laboratory analyses shall be collected from stored water bodies and tested on a weekly basis during periods of discharge. Where no turbidity correlation has been achieved, an acceptable suspended solid test result must be obtained prior to commencement of release.

Treatment of ponded water may include the addition of flocculating agents to reduce the suspended solids concentration, and /or the addition of hydrated lime to control pH. In no case should alum be used due to risks of creating additional aluminium toxicity.

6.2 Temporary Groundwater Monitoring

Groundwater monitoring will be carried out at eight monitoring locations (GW101 to GW108) to monitor groundwater, where it exists, and to identify potential impacts to groundwater as a result of construction activities. The location of proposed monitoring bores is illustrated in the groundwater monitoring location plan attached as Figure 5 at the end of this report.

Monitoring bores should be installed in accordance with *Minimum Construction Requirements for Water Bores in Australia*, published by the Queensland Department of Natural Resources, Mines and Energy, to a depth no greater than 6 m BGL.

Prior to commencement of construction works expected to impact groundwater at each monitoring location, a minimum 12 rounds of pre-construction monitoring will be completed (spanning a minimum 3-month period) to obtain a set of background values. Following completion of pre-construction monitoring, regular monitoring will continue throughout the construction period and for a period of 6 months post construction.

The median value of the monitoring results shall be calculated as a running value over the most recent 5 measured values to ascertain general compliance. In addition, individual values for each parameter will be plotted versus time on a graph to demonstrate any trends. Rainfall will also be plotted on the same graphs to illustrate the impacts of rainfall events on groundwater conditions. The running median values will be assessed for compliance against the 20th and 80th percentile background values.

All non-conformances must be recorded by the Contractor in the Environmental Incident Register. The register must be made available to the administering authority upon request.

Should the monitoring indicate no substantial changes to the surface water due to works on the site, the Principal may apply to the administering authority for a reduction of the post construction monitoring program. The monitoring parameters and frequencies are set out in Table 5.

Table 5: Temporary Groundwater Monitoring Parameters and Frequencies

Parameter	Monitoring Frequency		
	Pre-Construction	Construction Phase	Post Construction
Standing Groundwater Level	Weekly for a minimum 12 Rounds	Weekly throughout construction works likely to impact groundwater.	Weekly for a period of 3 months. Fortnightly thereafter for a consecutive 3 months.
pH			
Electrical Conductivity			
REDOX Potential			
Dissolved Iron		Monthly throughout construction works likely to impact groundwater.	Monthly following completion of construction.
Dissolved Aluminium			
Titrateable Acidity			
Chloride Sulfate Ratio			

Monitoring results will be plotted against time to identify any trends or variation from background levels based on the groundwater monitoring undertaken prior to any dewatering.

Groundwater observations and ASS testing completed during previous ASS and geotechnical investigations indicate that PASS is typically located below the existing groundwater table which is usually within 1.5 m of the ground surface level. Groundwater levels can also fluctuate by about 1 metre dependant on prevailing weather conditions and tidal variations. Thus, a drop-in groundwater by more than 1 m below the observed

preconstruction conditions would be expected to increase the likelihood of exposure of *in situ* PASS. It is therefore recommended that, should groundwater levels during construction consistently fall by more than 1.0 m below observed pre-construction levels, an ASS specialist should be engaged to determine whether there has been any significant environmental impact, why the unexpected drawdown is occurring and how the works may safely progress.

In the event of significant prolonged drawdown (> 1.0 m below observed pre-construction levels for a period of more than one week), or a change in pH level by more than 1 pH unit is observed, dewatering must be ceased and the incident must be reported to the project Superintendent or Principal within 24 hours of occurrence. A report shall be prepared by the ASS specialist, which will set out details of the breach together with the proposed methodology for moving forward including additional management measures and monitoring to demonstrate the effectiveness of the revised strategy.

It is the project Principal's responsibility to inform the relevant administering authority where necessary, and within the required timeframes.

Where non-conformances occur, the suitably qualified ASS expert must be engaged within 24 hours to investigate the non-conformance, assess its likely impact and recommend remediation actions or revised management strategies to prevent future occurrences. The suitably qualified ASS expert will present a report for each such incident.

An assessment of the overall groundwater impacts following completion of post-construction monitoring will be completed and included within the closure report, as detailed in Section 7.

Groundwater sampling and field monitoring must be completed in accordance with the relevant guidelines and best practice methodologies, including the most recent version of the Department of Environment's water quality sampling manual. All samples requiring laboratory analysis are to be appropriately preserved and subsequently delivered in chilled and sealed containers within relevant holding times to a NATA accredited laboratory for analysis.

In the event that one or more of the groundwater quality monitoring wells are damaged and/or the collection of samples is no longer viable, a replacement monitoring well shall be installed forthwith.

6.3 Surface Water Monitoring

Surface water conditions in Raff Creek and Caboolture River will be regularly monitored throughout construction to gauge surface water condition and to identify potential impacts to surface water which may be resulting from disturbance of ASS or acidic soils during construction activities.

A Water Quality Monitoring Plan (WQMP) may be developed to monitor surface water quality with regard to the site to demonstrate compliance with approval conditions. However surface water monitoring as detailed herein will be completed primarily for the purpose of identifying potential water quality impacts with regard to ASS, should they occur. It is noted that construction waters will be contained and controlled within the development site by the Contractor and uncontrolled release of construction waters will not be permitted. Periodic increases in surface water monitoring may be undertaken to investigate potential impacts associated with non-conformance incidents (i.e. uncontrolled releases).

Surface water monitoring will be completed at five surface water monitoring locations. SW101 (Raff Creek) and SW102 (Caboolture River) will be located upstream of the development to provide an indication of background water quality conditions, SW103 (Raff Creek) and SW104 (Caboolture River) will be located immediately down-stream of the development site and at SW105 will be located at the confluence of Raff Creek and Caboolture River some 650 m downstream of the site. Surface watering monitoring will be conducted as per the parameters and frequencies described in Table 6 over page.

Table 6: Surface Water Monitoring Parameters and Frequencies

Parameter	Monitoring Frequency		
	Pre-Construction Phase	Construction Phase	Post Construction
pH (pH Unit)	Weekly for at least 12 rounds prior to construction	Weekly throughout construction works.	Weekly for a period of 3 months.
Electrical Conductivity (µS/cm)			
Dissolved Oxygen (%S)			
REDOX Potential (mV)			
Turbidity (NTU)			
Temperature (°C)			
Total Aluminium (mg/L)		Monthly throughout construction works.	Monthly following for a period of 3 months following completion of works.
Dissolved Aluminium (mg/L)			
Total Iron (mg/L)			
Dissolved Iron (mg/L)			
Total Suspended Solids (mg/L)			

General indication of surface water quality will be provided by comparison with upstream and baseline conditions and environmental values and water quality objectives for moderately disturbed, mid to upper estuary conditions, as provided within the Environmental Protection (Water) Policy 2009 for Caboolture River.

Results of regular surface water monitoring will be reviewed by the ASS Specialist and summarised with any comment as part of monthly environmental reporting provided to the Superintendent. The results of surface water monitoring would also be expected to be included in any reporting of non-conformance incidents.

Following the initial monitoring period, monitoring shall continue during the construction period.

7.0 RECORDS & REPORTING

Records must be kept by the Contractor of all information required to be kept under this ASSMP. These must include records of all background characterisations, environmental monitoring, soil testing, details of any incidents and notifications and validation testing.

These records must be made available to the Superintendent, relevant consultants and/or to the administering authority on request.

Monitoring results shall be produced and kept in a form that facilitates interpretation (i.e. excel spreadsheet), including notes (if any) pertaining to major construction activities, rainfall and issues likely to impact monitoring.

A monthly environmental report shall be prepared and provided to the site Superintendent to help gauge ongoing construction management. The report will be prepared on behalf of the Contractor and will summarise the results of environmental monitoring undertaken throughout the month. The monthly report shall include groundwater and surface water monitoring results as well as ASS characterisation and validation testing, together with discussion of any potential issues or non-compliances.

7.1 Closure Reporting

Following completion of bulk earthworks for each major works area (i.e. Wetlands, Borrow Area, etc.) and site remediation, a Closure Report will be prepared to detail the effectiveness of site management measures

undertaken during construction works. The closure report will summarise the details of ASS disturbance and management, including results of all ASS validation testing and site water quality monitoring and management (including records of discharge events). The following information will be included in the closure report:

- total final volumes and dimensions of material disturbed, and neutralisation treatment completed;
- location(s) of any external treatment and/or disposal of ASS;
- summary of verification testing results for material treated on or off site;
- details of soil management strategies completed (including evidence (photographic) of specific management measures such as application of lime, mixing, material storage and of treatment areas);
- details of groundwater management undertaken at the site;
- summary of monitoring results for construction waters and groundwater;
- details of any incidence of non-conformity with the approved ASSMP and corrective actions taken;
- proposed future monitoring and/or reporting programs; and
- recommendations of any proposed remediation, if needed.

8.0 LIMITATIONS

This ASSMP has been developed to include procedures and recommendations aimed at minimising of the potential for adverse environmental impacts to result from the proposed disturbance of soils required at this development site.

Should modifications to the procedures and recommendations made in this management plan be proposed, such modifications must be approved by the appropriate regulatory authorities, in writing prior to any modifications being implemented.

Your attention is drawn to the document “Limitations”, which is included in Appendix F of this report. The statements presented in this document are intended to advise you of what your realistic expectations of this report should be, and to present you with recommendations on how to minimise the risks associated with the services provided by Tectonic for this project.



PROJECT:
**MIBA - NORTH HARBOUR
ASS INVESTIGATION &
MANAGEMENT PLAN**





TITLE:
GENERAL LAYOUT PLAN

CLIENT:
**NORTH HARBOUR HOLDINGS
PTY LTD**

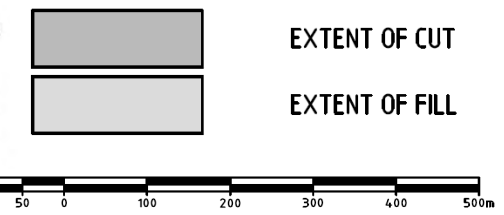
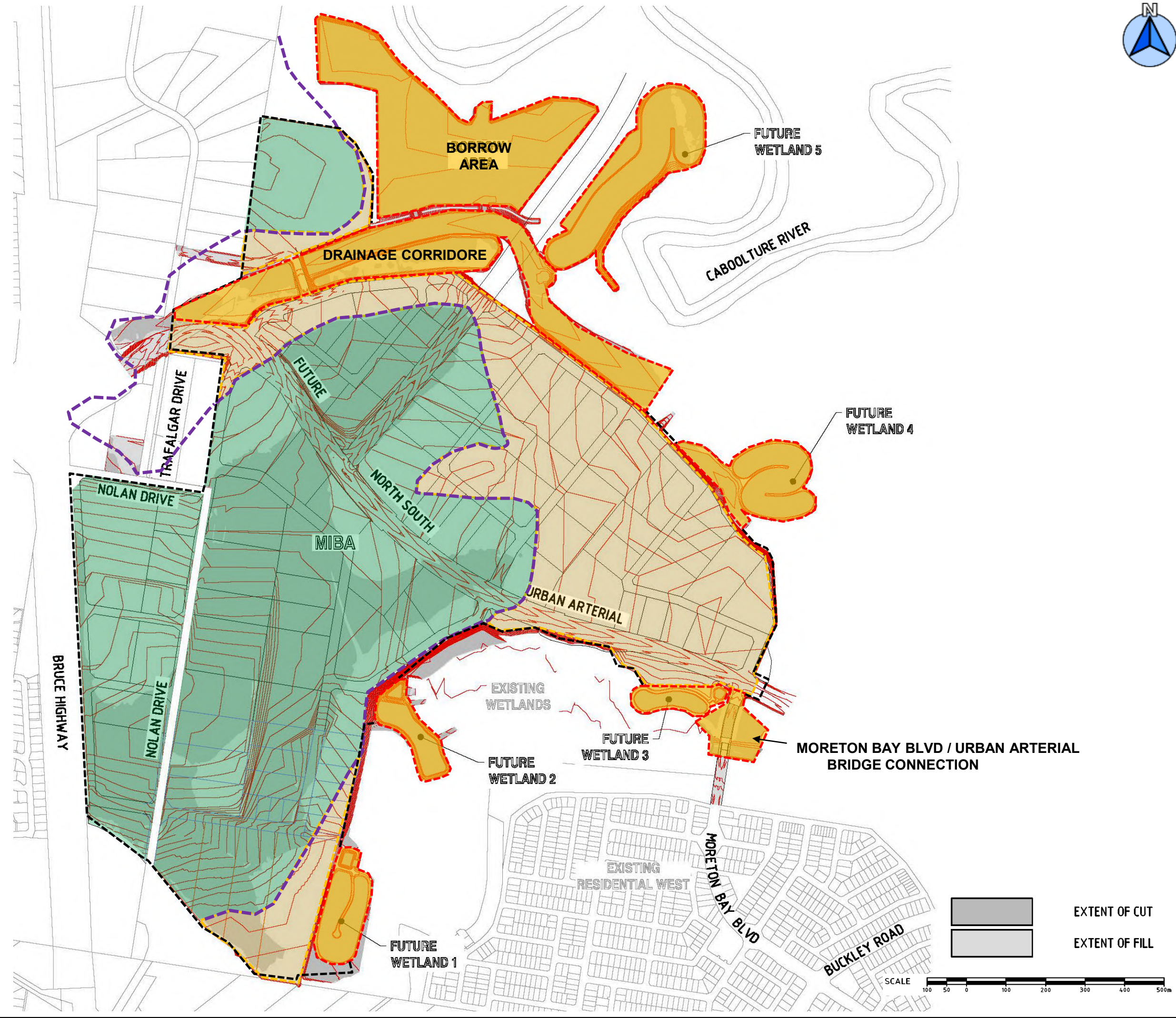
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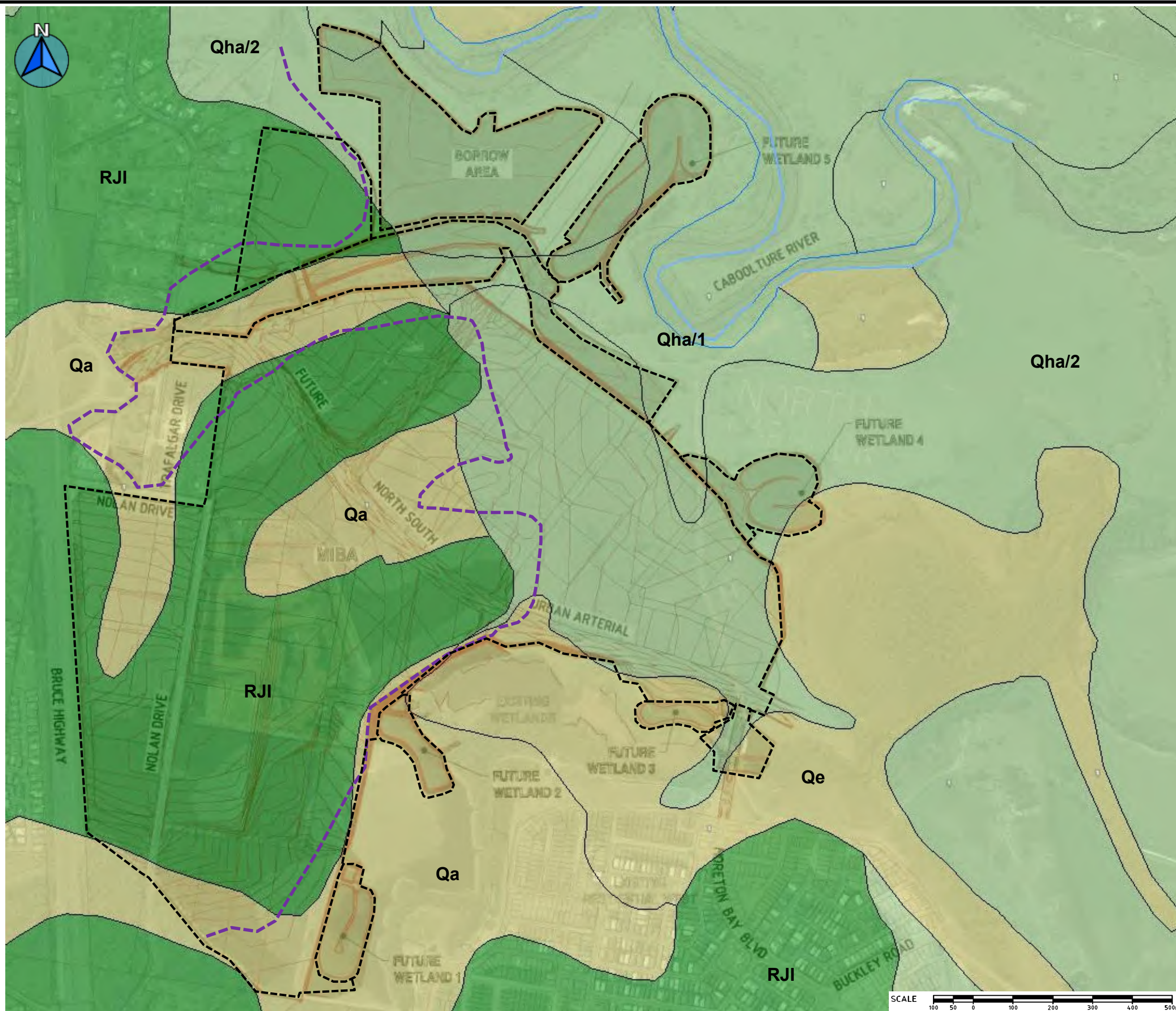
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ACD	24/10/2019

SCALE:
AS SHOWN

- LEGEND:
-  APPROX RL 5 m AHD CONTOUR
 -  BULK CUT OCCURRING < RL 5 m
 - FUTURE WETLANDS (No. 1-5)
 - MORETON BAY BLVD / URBAN ARTERIAL BRIDGE CONNECTION
 - COMPENSATORY CUT
 - NTH BORROW AREA
 - DRAINAGE CORRIDORE
 -  BULK FILLING OCCURRING < RL 5 m
 -  CUT / FILL OCCURRING > RL 5 m

PROJECT NO.:	FIGURE:	REV.:
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PROJECT:

MIBA - NORTH HARBOUR
ASS INVESTIGATION &
MANAGEMENT PLAN

TITLE:

GEOLOGY PLAN

CLIENT:

NORTH HARBOUR HOLDINGS
PTY LTD

DRAWN:

MT

DATE:

24/10/2019

CHECKED:

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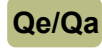
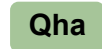
DATE:

24/10/2019

SCALE:

AS SHOWN

LEGEND:

-  APPROX RL 5 m AHD CONTOUR
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LANDSBOROUGH SANDSTONE
-  QUATERNARY AGE
ALLUVIAL SEDIMENTS
Qa – Flood Plain Alluvium
Qe – Estuarine Alluvium
-  HOLOCENE AGE
RIVER TERRACE ALLUVIUM

PROJECT NO.:

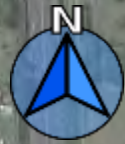
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FIGURE:

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PROJECT:

MIBA - NORTH HARBOUR
ASS INVESTIGATION &
MANAGEMENT PLAN

TITLE:

INVESTIGATION LOCATION
PLAN

CLIENT:

NORTH HARBOUR HOLDINGS
PTY LTD

DRAWN:

MT

DATE:

24/10/2019

CHECKED:

ACD




DATE:

24/10/2019

SCALE:

AS SHOWN

LEGEND:

-  APPROX RL 5 m AHD CONTOUR
-  CURRENT INVESTIGATION BOREHOLE
-  PREVIOUS INVESTIGATION BOREHOLE

PROJECT NO.:

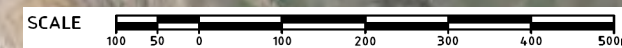
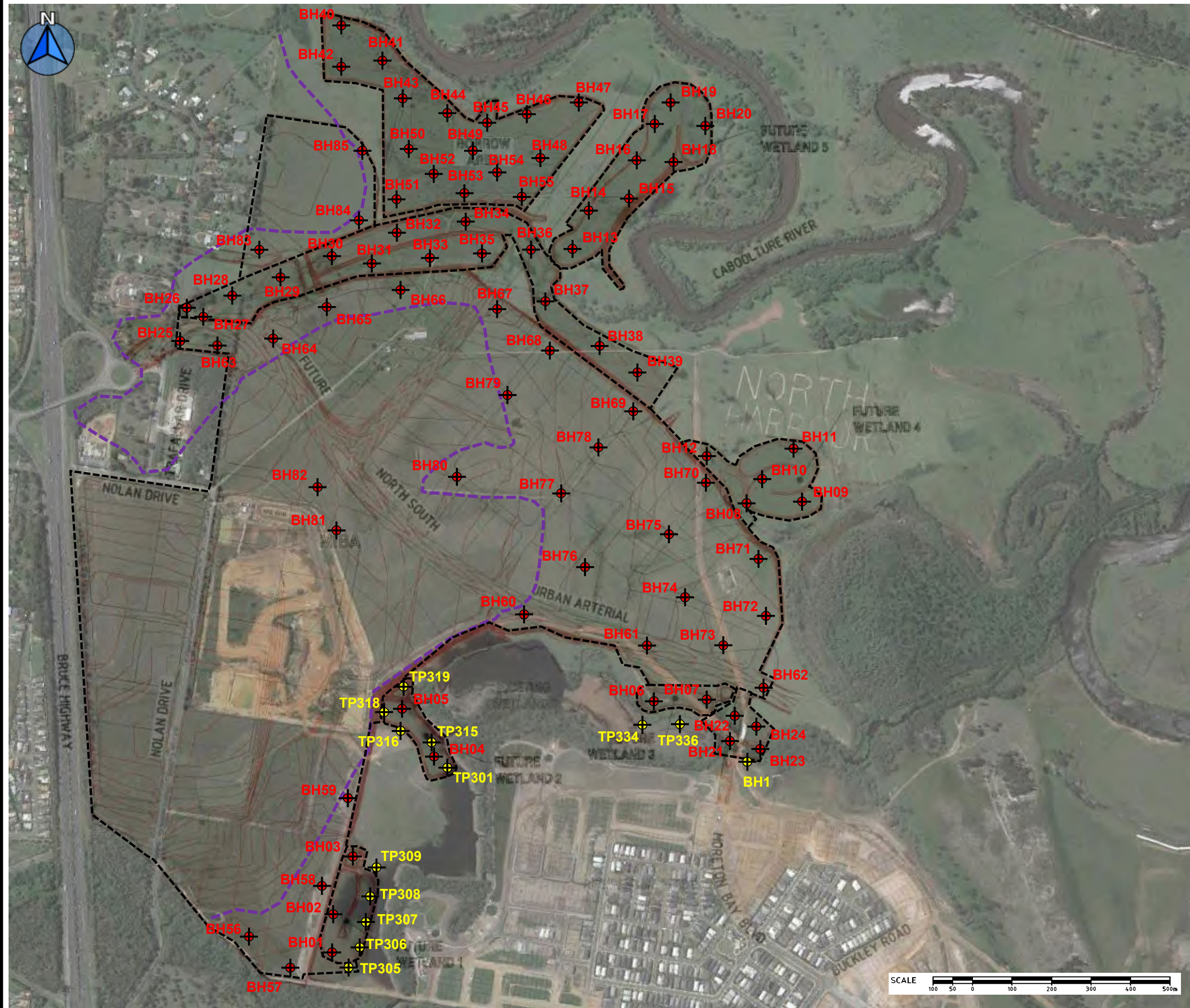
19210-001

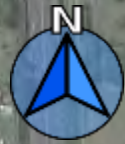
FIGURE:

3

REV:

0





PROJECT:

MIBA - NORTH HARBOUR
ASS INVESTIGATION &
MANAGEMENT PLAN

TITLE:

ASS DISTRIBUTION PLAN

CLIENT:

NORTH HARBOUR HOLDINGS
PTY LTD

DRAWN:

MT

DATE:

24/10/2019

CHECKED:

ACD





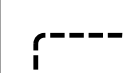
DATE:

24/10/2019

SCALE:

AS SHOWN

LEGEND:

-  APPROX RL 5 m AHD CONTOUR
-  POSITIVE AASS / PASS (>18 mol / tonne)
-  AASS / RETAINED ACIDITY ONLY (NO PASS) (>18 mol / tonne)
-  ANS SOIL (> 50 mol / tonne) (NON AASS / NON PASS)
-  NON ACIDIC (< 50 mol / tonne ANS) (NON AASS / NON PASS)

PROJECT NO.:

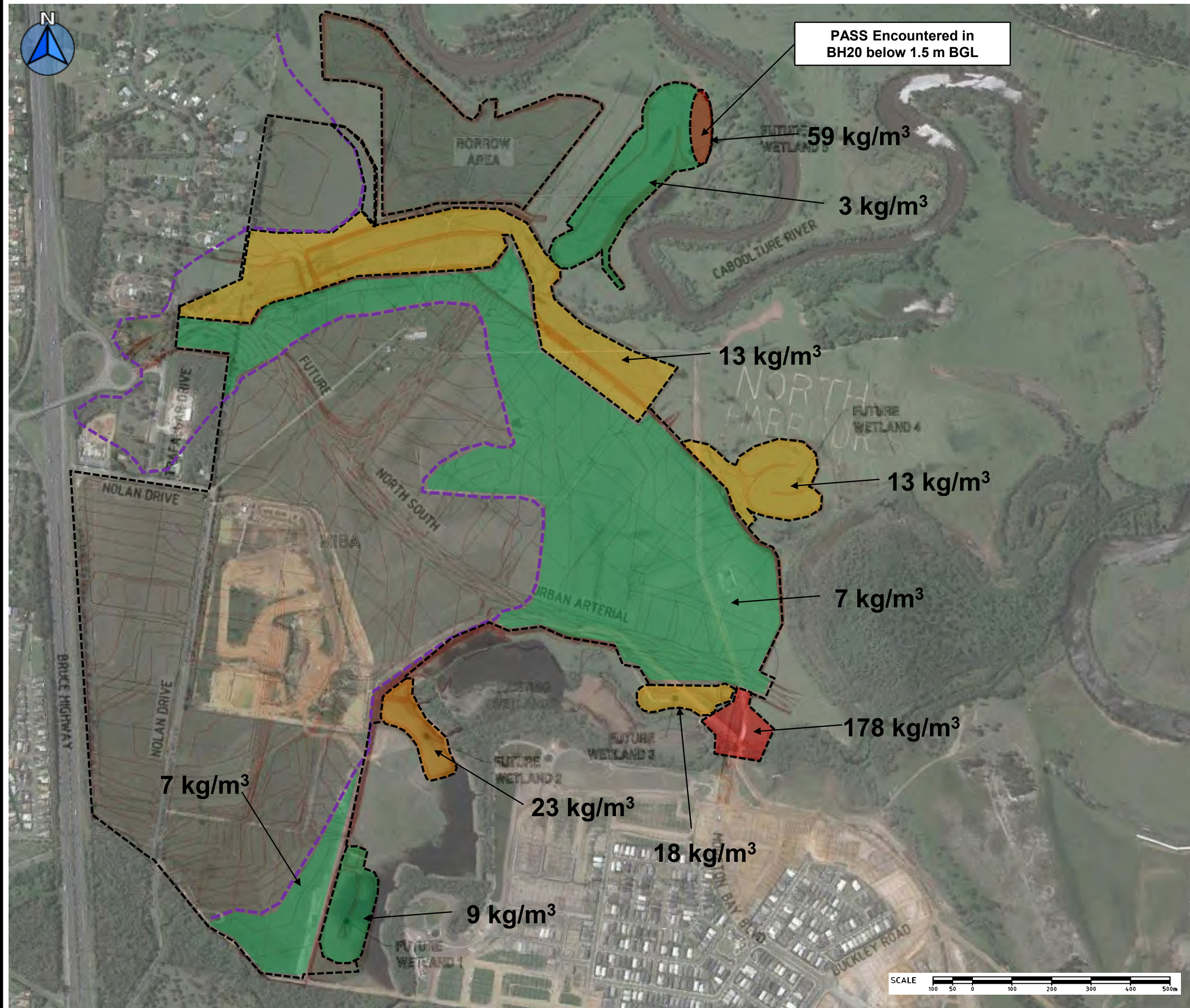
19210-001

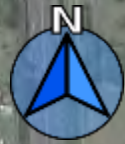
FIGURE:

4

REV:

0





PROJECT:

MIBA - NORTH HARBOUR
ASS INVESTIGATION &
MANAGEMENT PLAN

TITLE:

GROUNDWATER MONITORING
PLAN

CLIENT:

NORTH HARBOUR HOLDINGS
PTY LTD

DRAWN:

MT

DATE:

24/10/2019

CHECKED:

ACD

DATE:

24/10/2019

SCALE:

AS SHOWN

LEGEND:



GROUNDWATER MONITORING
BORE

PROJECT NO.:

19210-001

FIGURE:

5

REV:

0



Tectonic Geotechnical Pty Ltd
PO Box 899
Buderim Qld 4556
Ph: 07 5478 9016

PROJECT:
**MIBA - NORTH HARBOUR
ASS INVESTIGATION &
MANAGEMENT PLAN**

TITLE:
**SURFACE WATER
MONITORING PLAN**

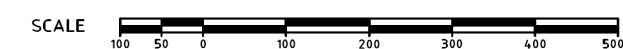
CLIENT:
**NORTH HARBOUR HOLDINGS
PTY LTD**

DRAWN:	DATE:
MT	24/10/2019

CHECKED:	DATE:
ACD	24/10/2019

SCALE:
AS SHOWN

LEGEND:
 SURFACE WATER MONITORING LOCATION



PROJECT NO.:	FIGURE:	REV:
19210-001	6	0

APPENDIX A

Current Investigation Borehole Logs & Explanatory Notes Supplementary Borehole and Test Pit Logs & Explanatory Notes

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 11/09/2019		
Project Name: MIBA - North Harbour	Completed: 11/09/2019		
Hole Location:	Logged By: MT		
Hole Position: 498392.0 m E 7000204.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 1.6m			0.00	[Hatching]	SP	SAND (TOPSOIL), fine to medium grained, dark brown, silt fines	M	MD			0.00: TOPSOIL
						0.25	[Orange]	CH	Sandy CLAY, high plasticity, brown to grey, fine to coarse grained sand, trace of fine to medium sized gravel and silt fines					VSt
						0.50	[Grey]	CH	CLAY, high plasticity, pale grey, trace of silt and fine grained sand	H				
						1.60	[Orange]	CH	Sandy CLAY, medium plasticity, pale grey, fine to medium grained sand and silt fines					D to M
1.60			Hole Terminated at 1.60 m Auger Refusal								1.10: Distinctly Weathered SANDSTONE			
						2.00								
						2.50								
						3.00								
						3.50								
						4.00								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>[Hatching] Core recovered (hatching indicates material) [Orange] Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:35 10.01.00.01 Datagel Lab and In Situ Tool - DSD [Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 11/09/2019		
Project Name: MIBA - North Harbour	Completed: 11/09/2019		
Hole Location:	Logged By: MT		
Hole Position: 498383.0 m E 7000300.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations					
Method	Penetration	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations		
AD/T	Not Encountered	ASS Samples at 0.25m Intervals at 2.5m			0.00		SP	SAND (TOPSOIL), fine to medium grained, dark brown, with silt fines	M	MD			0.00: TOPSOIL		
					0.20		CI-CH	Silty CLAY, medium to high plasticity, dark brown to pale grey, with fine to medium grained sand					St	xx	0.20: NATURAL
					0.50		CH	CLAY, high plasticity, pale brown to pale grey, with fine to coarse grained sand, trace of fine sized gravel						*	
					1.00		CH	Sandy CLAY, high plasticity, pale grey, fine to coarse grained sand, trace of fine sized gravel					VSt		
					2.10		CI	CLAY, medium plasticity, pale grey, fine to coarse grained sand, with silt fines					D to M	H	
					2.50			Hole Terminated at 2.50 m Target depth							
					3.00										
					3.50										
					4.00										

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:35 10.01.00.01 Datagel Lab and In Situ Tool - DSD [Lib: Tectonic 2.00.2 2016-10-13 Pjt: Tectonic 2.00 2016-02-16]

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 11/09/2019		
Project Name: MIBA - North Harbour	Completed: 11/09/2019		
Hole Location:	Logged By: MT		
Hole Position: 498437.0 m E 7000441.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations			
Method	Penetration	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered	ASS Samples at 0.25m Intervals to 2.5m			0.00		SP	SAND (TOPSOIL), fine to medium grained, dark brown, silt fines	D to M	MD		100	0.00: TOPSOIL
					0.25		CH	Sandy CLAY, high plasticity, red to grey, fine to coarse grained sand, trace of fine sized gravel and silt fines			200	**	
					1.00		CH	CLAY, high plasticity, grey, with fine to medium grained sand		VSt	300	1.00: Friable	
					1.50		CH	Sandy CLAY, high plasticity, pale brown, fine to coarse grained sand	M	VSt to H	400		
					2.25		CI	Sandy CLAY, medium plasticity, fine to medium grained sand and silt fines		VSt	500	2.25: Distinctly Weathered SANDSTONE	
					2.50			Hole Terminated at 2.50 m Target depth					

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:35 10.01.00.01 Datag Lab and In Situ Tool - DSD [Lib: Tectonic 2.00.2 2016-10-13 Pjt: Tectonic 2.00 2016-02-16]

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 11/09/2019		
Project Name: MIBA - North Harbour	Completed: 11/09/2019		
Hole Location:	Logged By: MT		
Hole Position: 498644.0 m E 7000703.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	[Hatched pattern]	Groundwater level at 1.0m [Symbol]	ASS Samples at 0.25m Intervals to 2.0m	[Symbol]		0.0	[Symbol]	SM	Silty SAND (TOPSOIL), fine to medium grained, dark brown, silt fines	D to M	MD		100	0.00: TOPSOIL
						0.25	[Symbol]	CH	Sandy CLAY, high plasticity, orange and grey, fine to coarse grained sand			200		
						0.5	[Symbol]			VSt	300			
						1.0	[Symbol]	CH	CLAY, high plasticity, grey, trace of fine to medium grained sand	M		400		
						1.5	[Symbol]	CH	Sandy CLAY, high plasticity, grey, fine to medium grained sand	M to W	F	500		
						2.0								
						2.0			Hole Terminated at 2.00 m Target depth					
						2.5								
						3.0								
						3.5								
						4.0								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal [Symbol] Inflow [Symbol] Partial Loss [Symbol] Complete Loss [Symbol]</p>	<p>Water</p> <p>Level (Date) [Symbol] Inflow [Symbol] Partial Loss [Symbol] Complete Loss [Symbol]</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>[Symbol] Core recovered (hatching indicates material) [Symbol] Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:36 10.01.00.01 Datagel Lab and In Situ Tool - DGD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 11/09/2019		
Project Name: MIBA - North Harbour	Completed: 11/09/2019		
Hole Location:	Logged By: MT		
Hole Position: 498567.0 m E 7000825.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
E	Not Encountered					0.00		SM	Silty SAND (TOPSOIL), fine to medium grained, dark brown, with clay fines	M	MD			0.00: TOPSOIL
						0.50		CI	Sandy CLAY, medium plasticity, pale brown to brown, fine to coarse grained sand					VSt
						1.00			becoming pale brown	D to M	H			
						2.00			Hole Terminated at 2.00 m Auger Refusal					
						2.50								
						3.00								
						3.50								
						4.00								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:36 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 11/09/2019		
Project Name: MIBA - North Harbour	Completed: 11/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 499201.0 m E 7000841.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations	
AD/T	Not Encountered	ASS Samples at 0.25m Intervals to 2.0m			0.00		CH	Silty CLAY (TOPSOIL), high plasticity, dark brown, trace of organic material	M	Vst		100	0.00: TOPSOIL	
					0.20							200	0.20: FILL	
					0.75		CH	Sandy CLAY, high plasticity, pale grey, fine to medium grained sand	F	300	0.75: ALLUVIUM			
					1.00		CH	Silty CLAY, high plasticity, pale brown and grey, trace of fine grained sand		400				
					1.50				St		500			
					2.00			Hole Terminated at 2.00 m Target depth						

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>Core recovered (hatching indicates material) Core loss</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:37 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client:	North Harbour Holdings Pty Ltd.	Commenced:	11/09/2019
Project Name:	MIBA - North Harbour	Completed:	11/09/2019
Hole Location:		Logged By:	BZ
Hole Position:	499335.0 m E 7000846.0 m N MGA94 Zone 56	Checked By:	ACD
Drill Model and Mounting:	Edson CP1	Inclination:	-90°
Hole Diameter:	100 mm	RL Surface:	No survey
		Bearing:	360°
		Datum:	AHD
		Operator:	

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	[Hatched]		ASS Samples at 0.25m Intervals to 2.0m			0.0	[X]	MH	Clayey SILT, high plasticity, dark grey, with organic material	M	F		100	
						0.25	[X]		trace of organic material				200	
						0.5	[X]	CH	Silty CLAY, high plasticity, pale brown and grey		St		300	
						1.0	[X]		becoming grey, trace of fine grained sand		F		400	
						1.5	[X]		becoming grey and brown	W	St		500	
						2.0	[X]		Hole Terminated at 2.00 m Target depth					
						2.5								
						3.0								
						3.5								
						4.0								

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:37 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>[Symbol] Level (Date) [Symbol] Inflow [Symbol] Partial Loss [Symbol] Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>[Symbol] Core recovered (hatching indicates material) [Symbol] Core loss</p>		<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>			
		<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 11/09/2019		
Project Name: MIBA - North Harbour	Completed: 11/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 499433.0 m E 7001351.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations						
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations		
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 2.0m			0.0		MH	Clayey SILT (TOPSOIL), medium plasticity, brown, trace of organic material and fine grained sand	D				0.00: TOPSOIL		
						0.25		CH	Silty CLAY, high plasticity, brown, trace of fine grained sand		VSt					
						0.5										
						1.0		CH	Sandy CLAY, high plasticity, pale grey, fine to medium grained sand	M	F					
						1.5		CH	Silty CLAY, high plasticity, red and grey, trace of fine grained sand							
						2.0			Hole Terminated at 2.00 m Target depth							
						2.5										
						3.0										
						3.5										
						4.0										

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:37 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 11/09/2019		
Project Name: MIBA - North Harbour	Completed: 11/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 499577.0 m E 7001356.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations						
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations		
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 2.0m			0.0		MH	Clayey SILT (TOPSOIL), high liquid limit, brown, trace of organic material	D	VSt			0.00: TOPSOIL		
						0.25		CH	Silty CLAY, high plasticity, brown, trace of fine grained sand							
						0.5			becoming pale brown		St					
						1.0		CH	Sandy CLAY, high plasticity, pale grey, fine to medium grained sand	M	F					
						1.5		CH	Silty CLAY, high plasticity, red, orange and grey, trace of fine to medium grained sand		St					
						2.0			Hole Terminated at 2.00 m Target depth							
						2.5										
						3.0										
						3.5										
						4.0										

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:38 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 12/09/2019		
Project Name: MIBA - North Harbour	Completed: 12/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 499473.0 m E 7001415.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations			
Method	Penetration	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered	ASS Samples at 0.25m Intervals to 2.0m			0.0		CH	Silty CLAY (TOPSOIL), high plasticity, brown, trace of organic material	D				0.00: TOPSOIL
					0.5		CH	Silty CLAY, high plasticity, brown, trace of fine grained sand	VSt				
					1.0			becoming brown and red, with fine to medium grained sand					
					1.5			becoming brown and orange	M				
					2.0			Hole Terminated at 2.00 m Target depth					
					2.5								
					3.0								
					3.5								
					4.0								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:38 10.01.00.01 Datagel Lab and In Situ Tool - DSD [Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 12/09/2019		
Project Name: MIBA - North Harbour	Completed: 12/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 499555.0 m E 7001486.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations			
Method	Penetration	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T		ASS Samples at 0.25m Intervals to 3.0m					CH	Silty CLAY, high plasticity, dark brown, with organic material	D				
					0.5			becoming brown and grey, trace of fine grained sand, without organic material		VSt		x	
					1.0							x	
					1.5			becoming grey, trace of fine to medium grained sand	M			x	
					2.0					F		x	
					2.5			becoming grey and brown, with fine to medium grained sand		St		x	
					3.0			Hole Terminated at 3.00 m Target depth				x	

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:38 10.01.00.01 Dajel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pjt: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 12/09/2019		
Project Name: MIBA - North Harbour	Completed: 12/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 499339.0 m E 7001467.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 2.0m			0.0		CH	Silty CLAY (TOPSOIL), high plasticity, brown, trace of organic material	D	H			0.00: TOPSOIL
						0.5		CH	Silty CLAY, high plasticity, brown, trace of fine grained sand	H				
						1.0			becoming red and grey, without sand	M				
						1.5			becoming orange and grey					
						2.0			Hole Terminated at 2.00 m Target depth					
						2.5								
						3.0								
						3.5								
						4.0								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:39 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client:	North Harbour Holdings Pty Ltd.	Commenced:	12/09/2019
Project Name:	MIBA - North Harbour	Completed:	12/09/2019
Hole Location:		Logged By:	BZ
Hole Position:	498996.0 m E 7002000.0 m N MGA94 Zone 56	Checked By:	ACD
Drill Model and Mounting:	Edson CP1	Inclination:	-90°
Hole Diameter:	100 mm	RL Surface:	No survey
		Bearing:	360°
		Datum:	AHD
		Operator:	

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T		Not Encountered	ASS Samples at 0.25m Intervals to 3.5m			0.0 to 3.5	[Graphic Log]	CH	Silty CLAY, high plasticity, grey, trace of organic material becoming grey and brown	D	H		100, 200, 300, 400, 500	
						1.5	[Graphic Log]		becoming brown and pale brown		VSt			
						2.0	[Graphic Log]				M			
						2.5	[Graphic Log]							
						3.0	[Graphic Log]		becoming pale brown and orange					
						3.5	[Graphic Log]		Hole Terminated at 3.50 m Target depth		St			
						4.0	[Graphic Log]							

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:39 10.01.00.01 Datagel Lab and In Situ Tool - DGD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 12/09/2019		
Project Name: MIBA - North Harbour	Completed: 12/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 499037.0 m E 7002093.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations			
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 3.5m			0.00		CH	Silty CLAY (TOPSOIL), high plasticity, brown, trace of organic material	D	H	100	0.00: TOPSOIL
						0.25		CH	Silty CLAY, high plasticity, brown, trace of fine to medium grained sand			200	
						0.50			becoming pale brown, without sand			300	
						1.00						400	
						1.50						500	
						2.00			becoming brown, trace of fine grained sand	M	VSt		
						2.50							
						3.00			with fine grained sand		St		
						3.50			Hole Terminated at 3.50 m Target depth				
						4.00							

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p></p> <p>Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:40 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 12/09/2019		
Project Name: MIBA - North Harbour	Completed: 12/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 499141.0 m E 7002126.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 3.5m			0.00		SM	Silty SAND (TOPSOIL), fine to medium grained, pale grey, trace of organic material	L				0.00: TOPSOIL
						0.25		CH	Silty CLAY, high plasticity, brown, trace of fine to medium grained sand and organic material	D				
						0.50			becoming dark brown, trace of fine grained sand	H			x	
						1.00							x	
						1.50			becoming brown and orange, without sand	M			x	
						2.00							x	
						2.50							x	
						3.00							x	
						3.50							x	
						3.50			Hole Terminated at 3.50 m Target depth					
						4.00								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:40 10.01.00.01 Datag Lab and In Situ Tool - DSD [Lib: Tectonic 2.00.2 2016-10-13 Pjt: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 12/09/2019		
Project Name: MIBA - North Harbour	Completed: 12/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 499160.0 m E 7002223.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations			
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 3.5m			0.00		CH	Silty CLAY (TOPSOIL), high plasticity, brown, trace of organic material	D			0.00: TOPSOIL
						0.25		CH	Silty CLAY, high plasticity, brown and grey	H			
						1.00		CH	Sandy CLAY, high plasticity, brown	VSt			
						3.50				St			
						3.50		Hole Terminated at 3.50 m Target depth					

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:40 10.01.00.01 Datagel Lab and In Situ Tool - DSD [Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 12/09/2019		
Project Name: MIBA - North Harbour	Completed: 12/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 499203.0 m E 7002318.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 3.5m			0.00		CH	Silty CLAY (TOPSOIL), high plasticity, dark grey, trace of organic material	D				0.00: TOPSOIL
						0.25		CH	Silty CLAY, high plasticity, dark grey and brown					
						0.50					VSt			
						1.00			becoming brown					
						1.50			becoming red and brown, trace of fine to medium grained sand					
						2.00				M				
						2.50			becoming brown, trace of fine grained sand		St			
						3.00			becoming brown and orange, with fine grained sand					
						3.50			Hole Terminated at 3.50 m Target depth					

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:41 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 12/09/2019		
Project Name: MIBA - North Harbour	Completed: 12/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 499249.0 m E 7002221.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations		
Method	Penetration	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered	ASS Samples at 0.25m Intervals to 3.5m					CH	Silty CLAY (TOPSOIL), high plasticity, dark brown, trace of organic material and fine grained sand	D			0.00: TOPSOIL
					0.5		CH	Silty CLAY, high plasticity, brown	D to M	H		
					1.0			becoming brown and grey, trace of fine grained sand				
					1.5							
					2.0					VSt		
					2.5					M		
					3.0							
					3.5			becoming brown and red		St		
					3.5			Hole Terminated at 3.50 m Target depth				
					4.0							

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:41 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 12/09/2019		
Project Name: MIBA - North Harbour	Completed: 12/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 499245.0 m E 7002367.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations			
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.5m Intervals to 3.5m			0.0		CH	Silty CLAY (TOPSOIL), high plasticity, dark brown, trace of organic material	D		100	
						0.5		CH	Silty CLAY, high plasticity, dark brown				
						0.5			becoming brown and grey, trace of fine grained sand				
						1.0				H			
						1.5							
						2.0			becoming grey, trace of fine to medium grained sand	M			
						2.5			becoming brown, without sand				
						3.0							
						3.5							
						3.5			Hole Terminated at 3.50 m Target depth				
						4.0							

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:41 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 12/09/2019		
Project Name: MIBA - North Harbour	Completed: 12/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 499328.0 m E 7002307.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations					
Method	Penetration	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations		
AD/T	Groundwater inflow at ~1.5m	ASS Samples at 0.25m Intervals to 3.5m			0.00		CH	Silty CLAY (TOPSOIL), high plasticity, brown, trace of organic material	M	VSt		x	0.00: TOPSOIL		
							CH	Silty CLAY, high plasticity, brown							
								becoming brown and grey							
								becoming grey							
								with sand							
							SC	Clayey SAND, fine to medium grained, grey, high plasticity clay fines					W	S	x
								becoming fine to coarse grained							
								trace of quartz pebbles							
								Hole Terminated at 3.50 m Target depth							

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:42 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 11/09/2019		
Project Name: MIBA - North Harbour	Completed: 11/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 499397.0 m E 7000746.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations			
Method	Penetration	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T		ASS Samples at 0.25m Intervals to 4.0m					ML-MH CH	Clayey SILT, medium liquid limit, dark brown, trace of organic material Silty CLAY, high plasticity, brown and grey	D			100 200 300 400 500	0.00: TOPSOIL
					0.5			becoming grey	M				
					1.0			becoming grey and brown, trace of organic material	F				
					1.5			without organic material	W	S			
					2.0								
					2.5								
					3.0								
					3.5								
					4.0			Hole Terminated at 4.00 m Target depth					

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:42 10.01.00.01 D:\ggl Lab and In Situ Tool - DSD [Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 11/09/2019		
Project Name: MIBA - North Harbour	Completed: 11/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 499410.0 m E 7000807.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations			
Method	Penetration	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	11/09/19 12:30, Groundwater level at 0.4m	ASS Samples at 0.25m Intervals to 2.5m			0.00		CH	Silty CLAY (TOPSOIL), high plasticity, dark grey, trace of organic material	M	F		100	0.00: TOPSOIL
					0.25	CH	Silty CLAY, high plasticity, grey and brown, trace of fine to medium grained sand	St				200	
					0.50	CH	Sandy CLAY, high plasticity, grey, fine to coarse grained sand	W	S		300		
					1.00	SC	Clayey SAND, fine to coarse grained, grey, high plasticity clay fines				400		
					1.50		becoming grey and brown	500					
2.00	SM	Silty SAND, fine to coarse grained, grey					2.10: Sand cemented						
2.50	CH	Sandy CLAY, high plasticity, grey, fine to coarse grained sand					2.40: Without cementing						
					2.50		Hole Terminated at 2.50 m Target depth						
					3.00								
					3.50								
					4.00								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>Core recovered (hatching indicates material) Core loss</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:43 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pjt: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client:	North Harbour Holdings Pty Ltd.	Commenced:	11/09/2019
Project Name:	MIBA - North Harbour	Completed:	11/09/2019
Hole Location:		Logged By:	BZ
Hole Position:	499467.0 m E 7000734.0 m N MGA94 Zone 56	Checked By:	ACD
Drill Model and Mounting:	Edson CP1	Inclination:	-90°
Hole Diameter:	100 mm	Bearing:	360°
		RL Surface:	No survey
		Datum:	AHD
		Operator:	

Drilling Information				Soil Description						Observations		
Method	Penetration	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T		ASS Samples at 0.25m Intervals to 3.0m					MH CH	Clayey SILT (TOPSOIL), low to high liquid limit, brown, trace of organic material Silty CLAY, high plasticity, brown and grey	D	VSt	100 x 200 x 300 x 400 x 500 x	0.00: TOPSOIL
					0.5			becoming grey and brown	M	F		
					1.0			becoming grey	S			
					1.5			becoming grey and dark grey, with fine to medium grained sand				
					2.0		CI	Sandy CLAY, medium plasticity, dark grey, fine to medium grained sand	W	VS		
					2.5		SC	Clayey SAND, fine to medium grained, grey, high plasticity clay fines				
					3.0			Hole Terminated at 3.00 m Target depth				

Method AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger	Penetration No resistance ranging to refusal 	Water Level (Date) Inflow Partial Loss Complete Loss	Samples and Tests U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test	Moisture Condition D - Dry M - Moist W - Wet	Consistency/Relative Density VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
Graphic Log/Core Loss Core recovered (hatching indicates material) Core loss	Classification Symbols and Soil Descriptions Based on Unified Soil Classification System	Plastic Limit < PL = PL > PL			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:43 10.01.00.01 Dajel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pjt: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 11/09/2019		
Project Name: MIBA - North Harbour	Completed: 11/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 499461.0 m E 7000771.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations			
Method	Penetration	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Groundwater inflow at 1.1m	ASS Samples at 0.25m Intervals to 2.5m			0.5		CH	Silty CLAY (TOPSOIL), high plasticity, brown, trace of organic material	M	St		100	0.00: TOPSOIL
							CH	Silty CLAY, high plasticity, brown and pale brown, trace of fine grained sand				200	
								becoming grey, trace of fine to medium grained sand				300	
								becoming grey and dark brown, trace of organic material (wood)				400	
							SC	Clayey SAND, fine to medium grained, dark grey, high plasticity clay fines				500	
		2.5	CH	Silty CLAY, high plasticity, grey and brown, with fine to medium grained sand	St								
					2.5		Hole Terminated at 2.50 m Target depth						
					3.0								
					3.5								
					4.0								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:43 10.01.00.01 Datagel Lab and In Situ Tool - DSD [Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client:	North Harbour Holdings Pty Ltd.	Commenced:	24/09/2019
Project Name:	MIBA - North Harbour	Completed:	24/09/2019
Hole Location:		Logged By:	BZ
Hole Position:	497987.0 m E 7001778.0 m N MGA94 Zone 56	Checked By:	ACD
Drill Model and Mounting:	Edson CP1	Inclination:	-90°
Hole Diameter:	100 mm	RL Surface:	No survey
		Bearing:	360°
		Datum:	AHD
		Operator:	

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered					0.00		CH	Silty CLAY, high plasticity, pale brown, with organic material	D	H			0.00: TOPSOIL
						0.00 - 0.50		CH	Silty CLAY, high plasticity, pale brown	H				
						0.50 - 1.50			becoming pale brown and red					
						1.50 - 2.00			becoming pale grey and grey					
						2.00			Hole Terminated at 2.00 m Target depth					
						2.50								
						3.00								
						3.50								
						4.00								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling MLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:44 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 24/09/2019		
Project Name: MIBA - North Harbour	Completed: 24/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498062.0 m E 7001780.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 2.0m			0.0	[Hatching]	CH	Silty CLAY (TOPSOIL), brown, trace of organic material	H				0.00: TOPSOIL
						0.5	[Hatching]		trace of fine to medium grained sand	D				
						1.0	[X's]	CH	Silty CLAY, high plasticity, grey and brown	M				
						2.0	[X's]		Hole Terminated at 2.00 m Target depth					
						2.5								
						3.0								
						3.5								
						4.0								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>[Hatching] Core recovered (hatching indicates material) [X's] Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

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Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 13/09/2019		
Project Name: MIBA - North Harbour	Completed: 13/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498056.0 m E 7001825.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations			
Method	Penetration	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered	ASS Samples at 0.25m Intervals to 3.0m			0.00		CH	Silty CLAY (TOPSOIL), high plasticity, brown, trace of organic material	D	H			0.00: TOPSOIL
							CH	Silty CLAY (FILL), high plasticity, red brown, trace of sub-rounded gravel					0.10: FILL (BASEMENT)
					0.50		CH	Silty CLAY, high plasticity, pale brown to brown		VSt			
					1.00			becoming grey and orange					
					1.50				M				
					2.00					St			
					2.50			becoming grey					
					3.00			Hole Terminated at 3.00 m Target depth					

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:44 10.01.00.01 Dajgel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client:	North Harbour Holdings Pty Ltd.	Commenced:	13/09/2019
Project Name:	MIBA - North Harbour	Completed:	13/09/2019
Hole Location:		Logged By:	BZ
Hole Position:	498135.0 m E 7001880.0 m N MGA94 Zone 56	Checked By:	ACD
Drill Model and Mounting:	Edson CP1	Inclination:	-90°
Hole Diameter:	100 mm	Bearing:	360°
		RL Surface:	No survey
		Datum:	AHD
		Operator:	

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T		Not Encountered	ASS Samples at 0.25m Intervals to 3.0m			0.00		CH	Silty CLAY (TOPSOIL), high plasticity, dark grey, trace of organic material	D				0.00: TOPSOIL
						0.5		CH	Silty CLAY, high plasticity, grey		VSt			
						1.0								
						1.5			becoming grey and brown					
						2.0			becoming pale brown to brown	M				
						2.5					St			
						3.0			Hole Terminated at 3.00 m Target depth					
						3.5								
						4.0								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:45 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client:	North Harbour Holdings Pty Ltd.	Commenced:	13/09/2019
Project Name:	MIBA - North Harbour	Completed:	13/09/2019
Hole Location:		Logged By:	BZ
Hole Position:	498254.0 m E 7001924.0 m N MGA94 Zone 56	Checked By:	ACD
Drill Model and Mounting:	Edson CP1	Inclination:	-90°
Hole Diameter:	100 mm	Bearing:	360°
		RL Surface:	No survey
		Datum:	AHD
		Operator:	

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T		Not Encountered	ASS Samples at 0.25m Intervals to 3.0m			0.0		CH	Silty CLAY (TOPSOIL), high plasticity, dark brown, trace of organic material	D				0.00: TOPSOIL
						0.5		CH	Silty CLAY, high plasticity, dark brown to brown, trace of fine grained sand	VSt			*	
						1.0			becoming brown, without sand				*	
						1.5			becoming pale brown				*	
						2.0			becoming pale brown and grey	M			*	
						2.5			becoming pale brown	St			*	
						3.0			Hole Terminated at 3.00 m Target depth					

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:45 10.01.00.01 Daigel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client:	North Harbour Holdings Pty Ltd.	Commenced:	13/09/2019
Project Name:	MIBA - North Harbour	Completed:	13/09/2019
Hole Location:		Logged By:	BZ
Hole Position:	498385.0 m E 7001977.0 m N MGA94 Zone 56	Checked By:	ACD
Drill Model and Mounting:	Edson CP1	Inclination:	-90°
Hole Diameter:	100 mm	Bearing:	360°
		RL Surface:	No survey
		Datum:	AHD
		Operator:	

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T		Groundwater inflow at 1.7m	ASS Samples at 0.25m Intervals to 3.0m			0.5		CH	Silty CLAY (TOPSOIL), high plasticity, dark grey, with organic material	VSt			100	0.00: TOPSOIL
						1.0		CH	Silty CLAY, high plasticity, grey and brown				M	
						1.5			becoming grey				300	
						2.0			becoming grey and red, trace of fine to medium grained sand	M to W	St		400	
						2.5			becoming pale grey and brown				500	
						3.0			Hole Terminated at 3.00 m Target depth					

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:46 10.01.00.01 Dajgel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pjt: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 13/09/2019		
Project Name: MIBA - North Harbour	Completed: 13/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498486.0 m E 7001968.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description					Observations				
Method	Penetration	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered	ASS Samples at 0.25m Intervals to 3.0m			0.5	[Graphic Log]	CL	Silty CLAY, low plasticity, dark grey	F			100	
							CH	Silty CLAY, high plasticity, dark grey				200	
					1.0			becoming grey				300	
					1.5		CI-CH	Sandy CLAY, medium to high plasticity, pale brown to orange and pale grey, fine to medium grained sand	M	St		400	
					2.0			becoming orange to red and pale grey				500	
					2.5								
					3.0			Hole Terminated at 3.00 m Target depth					
					3.5								
					4.0								

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:46 10.01.00.01 Dajgel Lab and In Situ Tool - DSD [Lib: Tectonic 2.00.2 2016-10-13 Pjt: Tectonic 2.00 2016-02-16]

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>Core recovered (hatching indicates material) Core loss</p>		<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>		<p>Plastic Limit</p> <p>< PL = PL > PL</p>	

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 13/09/2019		
Project Name: MIBA - North Harbour	Completed: 13/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498544.0 m E 7002037.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 3.0m			0.0	[Hatching]	CL	Silty CLAY, low plasticity, grey, trace of sand and organics	D	St			
						0.5	[Hatching]	CH	Silty CLAY, high plasticity, pale brown and grey					
						1.0	[Hatching]		becoming pale brown					
						1.5	[Hatching]			D to M	VSt			
						2.0	[Hatching]							
						2.5	[Hatching]							
						2.5	[Orange]	CI	Sandy CLAY, medium plasticity, brown and grey, fine to medium grained sand	M	St			
						3.0	[Orange]		Hole Terminated at 3.00 m Target depth					
						3.5								
						4.0								

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:46 10.01.00.01 Dajgel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pjt: Tectonic 2.00 2016-02-16

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>[Hatching] Core recovered (hatching indicates material) [Orange] Core loss</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>			

Engineering Log - Borehole

Project No.: 19210

Client:	North Harbour Holdings Pty Ltd.	Commenced:	13/09/2019
Project Name:	MIBA - North Harbour	Completed:	13/09/2019
Hole Location:		Logged By:	BZ
Hole Position:	498638.0 m E 7001982.0 m N MGA94 Zone 56	Checked By:	ACD
Drill Model and Mounting:	Edson CP1	Inclination:	-90°
Hole Diameter:	100 mm	Bearing:	360°
		RL Surface:	No survey
		Datum:	AHD
		Operator:	

Drilling Information				Soil Description					Observations					
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 3.0m			0.5 1.0 1.5 2.0 2.5 3.0		CL	Silty CLAY, low plasticity, grey, trace of sand and organics	D				
								CH	Silty CLAY, high plasticity, grey to brown					
								CI-CH	Sandy CLAY, medium to high plasticity, orange to brown, fine to medium grained sand, trace of fine sized gravel	M	St			
								CH	Silty CLAY, high plasticity, pale brown to orange and pale grey, trace of fine grained sand					
						3.0		Hole Terminated at 3.00 m Target depth						

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:47 10.01.00.01 Daigel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>			<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>		
			<p>Plastic Limit</p> <p>< PL = PL > PL</p>		

Engineering Log - Borehole

Project No.: 19210

Client:	North Harbour Holdings Pty Ltd.	Commenced:	13/09/2019
Project Name:	MIBA - North Harbour	Completed:	13/09/2019
Hole Location:		Logged By:	BZ
Hole Position:	498722.0 m E 7002059.0 m N MGA94 Zone 56	Checked By:	ACD
Drill Model and Mounting:	Edson CP1	Inclination:	-90°
Hole Diameter:	100 mm	Bearing:	360°
		RL Surface:	No survey
		Datum:	AHD
		Operator:	

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 3.0m			0.0	[Symbol]	CL	Silty CLAY, low plasticity, grey, trace of sand and organics	D				
						0.5	[Symbol]	CH	Silty CLAY, high plasticity, pale brown and grey					
						1.0	[Symbol]		becoming grey					
						1.5	[Symbol]			M	St			
						2.0	[Symbol]		becoming grey and brown					
						2.5	[Symbol]							
						3.0	[Symbol]		Hole Terminated at 3.00 m Target depth					
						3.5	[Symbol]							
						4.0	[Symbol]							

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:47 10.01.00.01 Dajel Lab and In Situ Tool - DSD [Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>Core recovered (hatching indicates material) Core loss</p>			<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>		
			<p>Plastic Limit</p> <p>< PL = PL > PL</p>		

Engineering Log - Borehole

Project No.: 19210

Client:	North Harbour Holdings Pty Ltd.	Commenced:	13/09/2019
Project Name:	MIBA - North Harbour	Completed:	13/09/2019
Hole Location:		Logged By:	BZ
Hole Position:	498767.0 m E 7001984.0 m N MGA94 Zone 56	Checked By:	ACD
Drill Model and Mounting:	Edson CP1	Inclination:	-90°
Hole Diameter:	100 mm	Bearing:	360°
		RL Surface:	No survey
		Datum:	AHD
		Operator:	

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered					0.0	[Hatched]	CL	Silty CLAY, low plasticity, dark grey, trace of organics	D				
						0.1	[Hatched]	CH	Silty CLAY, high plasticity, dark grey					
						0.5	[Hatched]		becoming grey					
						1.0	[Hatched]		becoming grey and pale brown					
						1.5	[Hatched]		with fine to coarse grained sand	M	St			
						2.0	[Hatched]							
						2.5	[Hatched]		becoming pale brown, trace of fine grained sand					
						3.0	[Hatched]		Hole Terminated at 3.00 m Target depth					
						3.5								
						4.0								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>[Hatched] Core recovered (hatching indicates material) [Dotted] Core loss</p>			<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>		
			<p>Plastic Limit</p> <p>< PL = PL > PL</p>		

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:47 10.01.00.01 Dajgel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client:	North Harbour Holdings Pty Ltd.	Commenced:	13/09/2019
Project Name:	MIBA - North Harbour	Completed:	13/09/2019
Hole Location:		Logged By:	BZ
Hole Position:	498888.0 m E 7002041.0 m N MGA94 Zone 56	Checked By:	ACD
Drill Model and Mounting:	Edson CP1	Inclination:	-90°
Hole Diameter:	100 mm	Bearing:	360°
		RL Surface:	No survey
		Datum:	AHD
		Operator:	

Drilling Information				Soil Description						Observations						
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations		
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 3.0m			0.0	[Hatching]	CL	Silty CLAY, low plasticity, dark grey, trace of organics	D						
						0.5	[Hatching]	CH	Silty CLAY, high plasticity, dark grey and brown							
						1.0	[Hatching]		becoming grey and pale brown, with fine to medium grained sand							
						1.5	[Hatching]	CI-CH	Silty CLAY, medium to high plasticity, pale brown to orange and pale grey, with fine to medium grained sand	M	St					
						3.0	[Hatching]		Hole Terminated at 3.00 m Target depth							
						3.5										
						4.0										

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>[Hatching] Core recovered (hatching indicates material) [Dotted] Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:48 10.01.00.01 Dajgel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pjt: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 23/09/2019		
Project Name: MIBA - North Harbour	Completed: 23/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498925.0 m E 7001858.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations		
Method	Penetration	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered	ASS Samples at 0.25m Intervals to 3.0m			0.00		CH	Silty CLAY, high plasticity, dark brown, trace of organic material	D			0.00: TOPSOIL
					0.10		CH	Silty CLAY, high plasticity, dark brown, trace of fine grained sand	H		x	0.10: ALLUVIUM
					0.50			becoming grey, with fine to medium grained sand	VSt	xx		
					1.00			trace of fine grained sand	St			
					1.50		CH	Sandy CLAY, high plasticity, pale brown, fine to medium grained sand	M		x	
AD/T	Not Encountered				2.00			becoming brown	VSt		x	
					2.25		SC	Clayey SAND, fine to medium grained, pale grey, high plasticity clay fines				2.25: RESIDUAL
					3.00			Hole Terminated at 3.00 m Target depth				

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:48 10.01.00.01 Dajgel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pjt: Tectonic 2.00 2016-02-16

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 23/09/2019		
Project Name: MIBA - North Harbour	Completed: 23/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 499063.0 m E 7001750.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations			
Method	Penetration	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered	ASS Samples at 0.5m Intervals to 3.0m			0.00		CH	Silty CLAY (TOPSOIL), high plasticity, brown, trace of organic material	D	H			0.00: TOPSOIL
					0.5		CH	Silty CLAY, high plasticity, brown and dark brown, trace of fine grained sand	H				
					1.0			becoming grey and red, trace of fine to medium grained sand		VSt			
					1.5			without sand					
					2.0			becoming grey	M				
					2.5			with fine to medium grained sand		St			
					3.0			Hole Terminated at 3.00 m Target depth					

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:48 10.01.00.01 Datagel Lab and In Situ Tool - DSD [Lib: Tectonic 2.00.2 2016-10-13 Pj]: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client:	North Harbour Holdings Pty Ltd.	Commenced:	23/09/2019
Project Name:	MIBA - North Harbour	Completed:	23/09/2019
Hole Location:		Logged By:	BZ
Hole Position:	499163.0 m E 7001680.0 m N MGA94 Zone 56	Checked By:	ACD
Drill Model and Mounting:	Edson CP1	Inclination:	-90°
Hole Diameter:	100 mm	Bearing:	360°
		RL Surface:	No survey
		Datum:	AHD
		Operator:	

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.5m Intervals to 3.0m			0.5			Silty CLAY (TOPSOIL), high plasticity, brown	D	H		100 200 300 400 500	0.00: TOPSOIL
						1.0		CH	Silty CLAY, high plasticity, grey and red, with fine to medium grained sand			x		
						1.5			becoming red and grey, trace of fine to medium grained sand			✱		
						2.0			becoming pale grey, with fine to medium grained sand	M	St	x		
						2.5			becoming pale brown, with fine to medium grained sand			x		
						3.0			Hole Terminated at 3.00 m Target depth					
						3.5								
						4.0								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:49 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pjt: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 23/09/2019		
Project Name: MIBA - North Harbour	Completed: 23/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498413.0 m E 7002569.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description					Observations					
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T		Not Encountered	ASS Samples at 0.5m Intervals to 3.5m			0.0		SM	Silty SAND (TOPSOIL), fine grained, grey, trace of organic material and low plasticity clay fines	D				0.00: TOPSOIL
						0.5		CH	Sandy CLAY, high plasticity, brown, fine to medium grained sand	D to M			x	
						1.0		CH	Silty CLAY, high plasticity, brown and dark grey, trace of fine to medium grained sand	VSt			x	
						1.5			becoming pale brown, without sand				x	
						2.0				M			x	
						2.5			trace of fine to medium sized gravel				x	
						3.0			trace of fine to medium grained sand				x	
						3.5			Hole Terminated at 3.50 m Target depth				x	

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:49 10.01.00.01 Datagel Lab and In Situ Tool - DSD [Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 24/09/2019		
Project Name: MIBA - North Harbour	Completed: 24/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498456.0 m E 7002524.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.5m Intervals to 3.5m			0.0		CI	Silty Sandy CLAY (TOPSOIL), medium plasticity, brown, trace of organic material, fine to medium grained sand	D				0.00: TOPSOIL
						0.5		CH	Silty CLAY, high plasticity, grey and brown, trace of fine grained sand					
						1.0			without sand					
						1.5				VSt				
						2.0				M				
						2.5								
						3.0			becoming grey, trace of fine grained sand					
						3.5				St				
						3.5			Hole Terminated at 3.50 m Target depth					
						4.0								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:50 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 23/09/2019		
Project Name: MIBA - North Harbour	Completed: 23/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498408.0 m E 7002479.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations								
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations				
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 3.5m			0.0		CH	Silty CLAY (TOPSOIL), high plasticity, brown, trace of organic material	D				0.00: TOPSOIL				
						0.25		CH	Silty CLAY, high plasticity, brown, trace of fine to medium grained sand									
						0.5												
						1.0								VSt				
						1.5							without sand					
						2.0							becoming dark brown, with fine to medium grained sand, trace of fine to medium sized sub-rounded gravel	M				
						2.5			without sand and gravel									
						3.0			becoming brown, trace of fine grained sand	St								
						3.5			Hole Terminated at 3.50 m Target depth									

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:50 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 23/09/2019		
Project Name: MIBA - North Harbour	Completed: 23/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498559.0 m E 7002380.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 3.5m			0.0		MH	Clayey Sandy SILT (TOPSOIL), high liquid limit, grey, trace of organic material	D	H			0.00: TOPSOIL
						0.5		CH	Silty CLAY, high plasticity, pale brown, trace of fine grained sand					
						1.0			becoming pale brown and dark grey, with organic material (wood)					
						1.5			becoming pale brown, without organic material		VSt			
						2.0					M			
						2.5			becoming pale brown and pale grey		St			
						3.0					VSt			
						3.5					St			
						3.5			Hole Terminated at 3.50 m Target depth					
						4.0								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:50 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 23/09/2019		
Project Name: MIBA - North Harbour	Completed: 23/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498710.0 m E 7002343.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations		
Method	Penetration	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered	ASS Samples at 0.25m Intervals to 3.5m			0.5		CH	Silty CLAY (TOPSOIL), high plasticity, grey and brown, trace of organic material	D			0.00: TOPSOIL
							CH	Silty CLAY, high plasticity, brown and orange, trace of fine grained sand				
					1.0			trace of coarse grained sand				
					1.5			becoming brown, without gravel				
					2.0							
					2.5			becoming pale grey and brown				
					3.0			becoming pale grey, trace of fine grained sand				
					3.5			Hole Terminated at 3.50 m Target depth				

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:51 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 24/09/2019		
Project Name: MIBA - North Harbour	Completed: 24/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498781.0 m E 7002344.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 3.5m			0.00		SM	Silty Clayey SAND (TOPSOIL), fine grained, brown, high plasticity, trace of organic material	D			100	0.00: TOPSOIL
						0.25		SM	Silty Clayey SAND, fine grained, brown, high plasticity clay fines					
						1.00		CH	Silty CLAY, high plasticity, brown, trace of fine to medium grained and and sub-rounded gravel	M	VSt	200		
						1.50						300		
2.00				St		400								
2.50						500								
3.00				CI	Silty CLAY, medium plasticity, brown and orange									
3.50														
						3.50			Hole Terminated at 3.50 m Target depth					
						4.00								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p></p> <p>Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 23/09/2019		
Project Name: MIBA - North Harbour	Completed: 23/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498883.0 m E 7002341.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 3.5m			0.00		SM	Silty SAND (TOPSOIL), fine grained sand, grey and brown, medium plasticity clay fines, trace of organic material	D	H			0.00: TOPSOIL
						0.25			Silty SAND, fine grained, grey and brown, medium plasticity clay fines					
						0.50		CH	Silty CLAY, high plasticity, dark brown, trace of fine grained sand					
						1.00			becoming brown, trace of coarse grained sand					
						1.50			without sand		VSt			
						2.00					M			
						2.50			becoming pale brown, with fine grained sand					
						3.00								
						3.50					St			
						3.50			Hole Terminated at 3.50 m Target depth					

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date)</p> <p>Inflow</p> <p>Partial Loss</p> <p>Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material)</p> <p> Core loss</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>			

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Engineering Log - Borehole

Project No.: 19210

Client:	North Harbour Holdings Pty Ltd.	Commenced:	23/09/2019
Project Name:	MIBA - North Harbour	Completed:	23/09/2019
Hole Location:		Logged By:	BZ
Hole Position:	499014.0 m E 7002368.0 m N MGA94 Zone 56	Checked By:	ACD
Drill Model and Mounting:	Edson CP1	Inclination:	-90°
Hole Diameter:	100 mm	Bearing:	360°
		RL Surface:	No survey
		Datum:	AHD
		Operator:	

Drilling Information				Soil Description						Observations			
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Sample at 0.25m Intervals to 3.5m			0.00		CH	Silty CLAY (TOPSOIL), high plasticity, grey, with organic material	H		100	0.00: TOPSOIL
						0.25		CH	Silty CLAY, high plasticity, brown, trace of fine grained sand			200	
						0.50			without sand	D		300	
						1.00				VSt		400	
						1.50						500	
						2.00			becoming brown and orange	M			
						2.50				St			
						3.00				VSt			
						3.50			becoming brown, trace of fine grained sand	St			
						3.50			Hole Terminated at 3.50 m Target depth				
						4.00							

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:52 10.01.00.01 Datagel Lab and In Situ Tool - DSD [Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16]

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 26/09/2019		
Project Name: MIBA - North Harbour	Completed: 26/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498913.0 m E 7002224.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T		Not Encountered	ASS Samples at 0.25m Intervals to 3.5m					CH	Silty CLAY (TOPSOIL), high plasticity, grey, trace of organic material	D				0.00: TOPSOIL
						0.5		CH	Silty CLAY, high plasticity, brown and dark brown, trace of fine grained sand				x	
						1.0			without sand				x	
						1.5			becoming brown and orange, trace of fine grained sand				x	
						2.0			becoming brown	VSt			x	
						2.5			becoming brown and red	M			x	
						3.0			becoming pale brown, with fine grained sand				x	
						3.5			Hole Terminated at 3.50 m Target depth	MD			x	
						4.0								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

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Engineering Log - Borehole

Project No.: 19210

Client:	North Harbour Holdings Pty Ltd.	Commenced:	26/09/2019
Project Name:	MIBA - North Harbour	Completed:	26/09/2019
Hole Location:		Logged By:	BZ
Hole Position:	498756.0 m E 7002250.0 m N MGA94 Zone 56	Checked By:	ACD
Drill Model and Mounting:	Edson CP1	Inclination:	-90°
Hole Diameter:	100 mm	Bearing:	360°
		RL Surface:	No survey
		Datum:	AHD
		Operator:	

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T		Not Encountered	ASS Samples at 0.25m Intervals to 3.5m					CH	Silty CLAY (TOPSOIL), high plasticity, grey, trace of organic material	D				0.00: TOPSOIL
						0.5		CH	Silty CLAY, high plasticity, grey, with fine grained sand	D to M	VSt			
						1.0			becoming brown and grey, trace of fine to medium grained sand		H		*	
						1.5			becoming pale brown, without sand				*	
						2.0							*	
						2.5			becoming brown and red				*	
						3.0			becoming orange, trace of fine grained sand				*	
						3.5			Hole Terminated at 3.50 m Target depth				*	
						4.0								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

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Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 26/09/2019		
Project Name: MIBA - North Harbour	Completed: 26/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498584.0 m E 7002257.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 3.5m			0.00		CH	Silty CLAY (TOPSOIL), high plasticity, dark brown, trace of organic material and fine to medium grained sand	D				0.00: TOPSOIL
						0.25		CH	Silty CLAY, high plasticity, brown, trace of fine grained sand	D to M				
						0.50			trace of fine sized rounded gravel		VSt			
						1.00			becoming pale brown, without gravel and sand					
						1.50								
						2.00			becoming pale brown and grey		M			
						2.50			becoming pale brown		St			
						3.00								
						3.50			Hole Terminated at 3.50 m Target depth					
						4.00								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>			<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>		
			<p>Plastic Limit</p> <p>< PL = PL > PL</p>		

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Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 26/09/2019		
Project Name: MIBA - North Harbour	Completed: 26/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498544.0 m E 7002118.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T		Not Encountered	ASS Samples at 0.25m Intervals to 3.5m			0.00		ML CH	Clayey SILT (TOPSOIL), low liquid limit, grey, trace of organic material Silty CLAY, high plasticity, brown, trace of fine to medium grained sand and fine sized gravel	D D to M			100 200 300 400 500	0.00: TOPSOIL
						0.5			becoming brown and grey, without gravel and sand	VSt				
						1.0								
						1.5								
						2.0				M				
						2.5			becoming grey and red	St				
						3.0			becoming brown					
						3.5			Hole Terminated at 3.50 m Target depth					
						4.0								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

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Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 26/09/2019		
Project Name: MIBA - North Harbour	Completed: 26/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498643.0 m E 7002188.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 3.5m			0.00		CH	Silty CLAY (TOPSOIL), high plasticity, brown, trace of organic material	D				0.00: TOPSOIL
						0.00 - 0.50		CH	Silty CLAY, high plasticity, brown and grey, trace of fine grained sand	D to M				
						0.50			without sand		VSt			
						1.00			becoming pale brown and grey, trace of fine to medium sized rounded gravel					
						1.50			becoming red and brown, trace of fine to medium grained sand					
						2.00					M			
						2.50						St		
						3.00								
						3.50								
						3.50			Hole Terminated at 3.50 m Target depth					
						4.00								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

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Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 26/09/2019	
Project Name: MIBA - North Harbour	Completed: 26/09/2019	
Hole Location:	Logged By: BZ	
Hole Position: 498735.0 m E 7002139.0 m N MGA94 Zone 56	Checked By: ACD	
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD
		Operator:

Drilling Information				Soil Description						Observations			
Method	Penetration	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations	
AD/T	Not Encountered	ASS Samples at 0.25m Intervals to 3.5m			0.0		CH	Silty Sandy CLAY (TOPSOIL), high plasticity, pale grey, trace of fine grained sand	D				0.00: TOPSOIL
					0.5		CH	Silty CLAY, high plasticity, brown and orange, trace of fine grained sand	D to M	H			
					1.0			becoming pale brown, without sand					
					1.5					VSt			
					2.0			becoming pale grey and brown, trace of fine grained sand		M			
2.5													
3.0			becoming orange										
3.5							Hole Terminated at 3.50 m Target depth						
					4.0								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

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Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 26/09/2019		
Project Name: MIBA - North Harbour	Completed: 26/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498811.0 m E 7002201.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations			
Method	Penetration	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered	ASS Samples at 0.25m Intervals to 3.5m					ML CH	Clayey SILT (TOPSOIL), low liquid limit, brown, trace of fine grained sand and organic material Silty CLAY, high plasticity, brown	D to M			100 200 300 400 500	0.00: TOPSOIL
					0.5			becoming brown and grey					
					1.0			becoming pale brown and grey					
					1.5			becoming brown and orange					
					2.0			becoming orange					
					2.5								
					3.0								
					3.5			Hole Terminated at 3.50 m Target depth					
					4.0								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

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Engineering Log - Borehole

Project No.: 19210

Client:	North Harbour Holdings Pty Ltd.	Commenced:	26/09/2019
Project Name:	MIBA - North Harbour	Completed:	26/09/2019
Hole Location:		Logged By:	BZ
Hole Position:	498869.0 m E 7002128.0 m N MGA94 Zone 56	Checked By:	ACD
Drill Model and Mounting:	Edson CP1	Inclination:	-90°
Hole Diameter:	100 mm	Bearing:	360°
		RL Surface:	No survey
		Datum:	AHD
		Operator:	

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 3.5m			0.00		CH	Silty CLAY (TOPSOIL), high plasticity, brown, trace of organic material	D	H			0.00: TOPSOIL
						0.25		CH	Silty CLAY, high plasticity, brown, trace of fine grained sand	D to M	H			
						0.50			becoming brown and orange					
						0.75			without sand					
						1.00								
						1.25								
						1.50								
						1.75								
						2.00								
						2.25								
2.50														
2.75														
3.00														
3.25														
3.50														
						3.50			Hole Terminated at 3.50 m Target depth					
						4.00								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:55 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pjt: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client:	North Harbour Holdings Pty Ltd.	Commenced:	27/09/2019
Project Name:	MIBA - North Harbour	Completed:	27/09/2019
Hole Location:		Logged By:	BZ
Hole Position:	498177.0 m E 7000247.0 m N MGA94 Zone 56	Checked By:	ACD
Drill Model and Mounting:	Edson CP1	Inclination:	-90°
Hole Diameter:	100 mm	Bearing:	360°
		RL Surface:	No survey
		Datum:	AHD
		Operator:	

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 2.0m			0.00		SM	Silty SAND (TOPSOIL), fine to medium grained, dark grey, trace of organic material				100	0.00: TOPSOIL
						0.25		SM	Silty SAND, fine to medium grained, grey				200	
						0.50			becoming pale grey and pale brown					
						1.00		SC	Clayey SAND, fine to medium grained, pale brown to orange, high plasticity clay fines	M				
						1.50		CH	Sandy CLAY, high plasticity, orange, fine to medium grained sand		St		x	
						2.00			Hole Terminated at 2.00 m Target depth				x	
						2.50								
						3.00								
						3.50								
						4.00								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:55 10.01.00.01 Datagel Lab and In Situ Tool - DSD [Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16]

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 27/09/2019		
Project Name: MIBA - North Harbour	Completed: 27/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498280.0 m E 7000166.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations			
Method	Penetration	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Groundwater inflow at 0.6m	ASS Samples at 0.25m Intervals to 2.0m			0.00		SM	Silty SAND (TOPSOIL), fine to medium grained, dark grey, trace of organic material	M				0.00: TOPSOIL
					0.25	SM	Silty SAND, fine to medium grained, grey and dark grey						
					0.50	SC	Clayey SAND, fine to medium grained, grey, high plasticity clay fines	W					
					1.00	CH	Sandy CLAY, high plasticity, pale brown and orange, fine to medium grained sand						
					1.50	CH	Silty CLAY, high plasticity, red and orange, trace of fine to medium grained sand	M					
2.00	Hole Terminated at 2.00 m Target depth												

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>Core recovered (hatching indicates material) Core loss</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:56 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pjt: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client:	North Harbour Holdings Pty Ltd.	Commenced:	27/09/2019
Project Name:	MIBA - North Harbour	Completed:	27/09/2019
Hole Location:		Logged By:	BZ
Hole Position:	498361.0 m E 7000373.0 m N MGA94 Zone 56	Checked By:	ACD
Drill Model and Mounting:	Edson CP1	Inclination:	-90°
Hole Diameter:	100 mm	RL Surface:	No survey
		Bearing:	360°
		Datum:	AHD
		Operator:	

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 2.0m			0.00		SM	Silty SAND (TOPSOIL), fine to medium grained, dark grey, trace of organic material	D				0.00: TOPSOIL
						0.25		SM	Silty SAND, fine to medium grained, dark grey and grey	D to M				
						1.00		CH	Silty CLAY, high plasticity, grey and red, with fine to medium grained sand, trace of fine to medium sized rounded gravel	VSt		*		
						1.50			becoming pale brown and orange, trace of fine to medium grained sand, without gravel	M		*		
						2.00			Hole Terminated at 2.00 m Target depth					
						2.50								
						3.00								
						3.50								
						4.00								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:56 10.01.00.01 Datagel Lab and In Situ Tool - DSD [Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16]

Engineering Log - Borehole

Project No.: 19210

Client:	North Harbour Holdings Pty Ltd.	Commenced:	27/09/2019
Project Name:	MIBA - North Harbour	Completed:	27/09/2019
Hole Location:		Logged By:	BZ
Hole Position:	498430.0 m E 700060.0 m N MGA94 Zone 56	Checked By:	ACD
Drill Model and Mounting:	Edson CP1	Inclination:	-90°
Hole Diameter:	100 mm	Bearing:	360°
		RL Surface:	No survey
		Datum:	AHD
		Operator:	

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 2.0m			0.00		SP	SAND (TOPSOIL), fine to medium grained, pale grey, trace of organic material	D				0.00: TOPSOIL
						0.25		SP	SAND, fine to medium grained, pale grey	D to M				
						0.50		SC	Clayey SAND, fine to medium grained, pale grey, high plasticity clay fines					
						1.00		CH	Sandy CLAY, high plasticity, pale grey and pale brown, fine to medium grained sand	VSt	x			
						1.50		CH	Silty CLAY, high plasticity, pale brown, trace of fine to medium grained sand	M		x		
						2.00			Hole Terminated at 2.00 m Target depth				x	
						2.50								
						3.00								
						3.50								
						4.00								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:56 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 27/09/2019		
Project Name: MIBA - North Harbour	Completed: 27/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498876.0 m E 7001060.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 2.0m			0.00		SM	Silty SAND (TOPSOIL), fine to medium grained, grey, trace of organic material	M				0.00: TOPSOIL
						0.25		SM	Silty SAND, fine to medium grained, dark grey, with high plasticity clay fines					
						0.50		CH	Sandy CLAY, high plasticity, pale brown	St	x			
						1.00		CH	Silty CLAY, high plasticity, pale brown and red, with fine to medium grained sand					
						1.50			becoming pale grey and brown, trace of fine grained sand	M	VSt			
						2.00			Hole Terminated at 2.00 m Target depth					
						2.50								
						3.00								
						3.50								
						4.00								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:57 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client:	North Harbour Holdings Pty Ltd.	Commenced:	27/09/2019
Project Name:	MIBA - North Harbour	Completed:	27/09/2019
Hole Location:		Logged By:	BZ
Hole Position:	499187.0 m E 7000987.0 m N MGA94 Zone 56	Checked By:	ACD
Drill Model and Mounting:	Edson CP1	Inclination:	-90°
Hole Diameter:	100 mm	RL Surface:	No survey
		Bearing:	360°
		Datum:	AHD
		Operator:	

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 2.0m			0.00		CH	Silty CLAY (TOPSOIL), high plasticity, dark brown, trace of organic material					0.00: TOPSOIL
						0.25		CH	Silty CLAY, high plasticity, brown and red, trace of fine to medium sized sub-rounded gravel		VSt			
						0.50			becoming pale grey, trace of fine grained sand					
						1.00			becoming brown, without sand	M				
						1.50			becoming pale grey and brown		St			
						2.00			trace of fine to medium grained sand					
						2.00			Hole Terminated at 2.00 m Target depth					
						2.50								
						3.00								
						3.50								
						4.00								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:57 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 24/09/2019		
Project Name: MIBA - North Harbour	Completed: 24/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 499480.0 m E 7000877.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 2.0m			0.0		SM	Silty SAND (TOPSOIL), fine to medium grained, grey, trace of organic material	D			100	0.00: TOPSOIL
						0.25		SC	Clayey SAND, fine to medium grained, brown, with high plasticity clay fines	M		200		
						0.5			becoming orange, trace of high plasticity clay fines		300			
						0.75		SP	SAND, fine to medium grained, pale grey	W		400		
						1.0			becoming grey		500			
1.25		SM	Silty SAND, fine to medium grained, brown to dark brown											
1.5		SC	Clayey SAND, fine to medium grained, pale grey, high plasticity clay fines											
2.0			Hole Terminated at 2.00 m Target depth											
						2.5								
						3.0								
						3.5								
						4.0								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:57 10.01.00.01 Datagel Lab and In Situ Tool - DGD | Lib: Tectonic 2.00.2 2016-10-13 Pjt: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 24/09/2019		
Project Name: MIBA - North Harbour	Completed: 24/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498159.0 m E 7001765.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 2.0m			0.0		CH	Silty CLAY (TOPSOIL), high plasticity, grey, trace of organic material and fine to medium grained sand	D	H			0.00: TOPSOIL
						0.5		CH	Silty CLAY, high plasticity, brown and grey, trace of fine to medium grained sand	D to M	H			
						1.0			becoming brown, with fine to medium grained sand	M	St			
						2.0			Hole Terminated at 2.00 m Target depth					
						2.5								
						3.0								
						3.5								
						4.0								

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:58 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

Engineering Log - Borehole

Project No.: 19210

Client:	North Harbour Holdings Pty Ltd.	Commenced:	24/09/2019
Project Name:	MIBA - North Harbour	Completed:	24/09/2019
Hole Location:		Logged By:	BZ
Hole Position:	498273.0 m E 7001710.0 m N MGA94 Zone 56	Checked By:	ACD
Drill Model and Mounting:	Edson CP1	Inclination:	-90°
Hole Diameter:	100 mm	Bearing:	360°
		RL Surface:	No survey
		Datum:	AHD
		Operator:	

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 2.0m			0.00		SM	Silty SAND (TOPSOIL), high plasticity, grey, low plasticity clay fines, trace of organic material	D				0.00: TOPSOIL
						0.25		SM	Silty SAND, fine grained, grey					
						0.50			becoming brown					
						1.00		CH	Sandy CLAY, high plasticity, brown, fine to medium grained sand	M	VSt		*	
						1.50		becoming grey and brown, trace of fine to medium sized gravel						
						2.00			Hole Terminated at 2.00 m Target depth					
						2.50								
						3.00								
						3.50								
						4.00								

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:58 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 24/09/2019		
Project Name: MIBA - North Harbour	Completed: 24/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498314.0 m E 7001826.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 2.0m			0.00		CH	Silty CLAY (TOPSOIL), high plasticity, grey, trace of organic material and fine to medium grained sand	D	H			0.00: TOPSOIL
						0.50		CH	Silty CLAY, high plasticity, grey and dark grey, trace of fine to medium grained sand		VSt		*	
						1.00			becoming brown and orange, with fine to medium grained sand	M			*	
						1.50					St		*	
						2.00			Hole Terminated at 2.00 m Target depth				*	
						2.50								
						3.00								
						3.50								
						4.00								

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:59 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 24/09/2019		
Project Name: MIBA - North Harbour	Completed: 24/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498558.0 m E 7001895.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 2.0m			0.0	[Hatched]	ML	Clayey SILT, low liquid limit, dark grey, with organic material	St				0.40: ALLUVIUM
						0.5	[X's]	CH	Silty CLAY, high plasticity, dark grey, trace of organic material					
						1.0	[Dashed]		becoming grey and brown					
						1.5	[Dashed]		becoming grey, with fine to medium grained sand					
						2.0	[X's]		Hole Terminated at 2.00 m Target depth					1.50: RESIDUAL
						2.5								
						3.0								
						3.5								
						4.0								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>[Hatched] Core recovered (hatching indicates material) [Dashed] Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:59 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 23/09/2019		
Project Name: MIBA - North Harbour	Completed: 23/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498801.0 m E 7001842.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 2.0m			0.0		CH	Silty CLAY (TOPSOIL), high plasticity, dark brown, trace of organic material	D				0.00: TOPSOIL
						0.5		CH	Silty CLAY, high plasticity, dark brown, trace of fine to medium grained sand	D to M	H			
						1.0			becoming grey and brown, without sand		St			
						1.5			becoming pale brown and orange, with fine to medium grained sand		M			
						2.0			Hole Terminated at 2.00 m Target depth		VSt			
						2.5								
						3.0								
						3.5								
						4.0								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 17:59 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 23/09/2019		
Project Name: MIBA - North Harbour	Completed: 23/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498941.0 m E 7001735.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 2.0m			0.5		CI	Silty Sandy CLAY (TOPSOIL), medium plasticity, brown, fine to medium grained sand, trace of organic material	D	H			0.00: TOPSOIL
								CH	Silty CLAY, high plasticity, dark brown and brown, trace of fine to medium grained sand	D to M	H		x	
						1.0			becoming brown and red, without sand				x	
						2.0			Hole Terminated at 2.00 m Target depth					
						2.5								
						3.0								
						3.5								
						4.0								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 18:00 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 23/09/2019		
Project Name: MIBA - North Harbour	Completed: 23/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 499148.0 m E 7001589.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description					Observations					
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T		Not Encountered	ASS Samples at 0.25m Intervals to 2.0m			0.0		CH	Silty CLAY (TOPSOIL), high plasticity, dark brown, trace of organic material		H			0.00: TOPSOIL
						0.5		CH	Silty CLAY, high plasticity, dark brown, trace of fine grained sand					
						1.0			becoming red and grey, trace of fine to coarse grained sand					
						1.5			trace of fine to medium grained sand		St			
						2.0			Hole Terminated at 2.00 m Target depth					
						2.5								
						3.0								
						3.5								
						4.0								

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 18:00 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 23/09/2019		
Project Name: MIBA - North Harbour	Completed: 23/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 499332.0 m E 7001397.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 2.0m			0.00		CH	Silty CLAY (TOPSOIL), high plasticity, brown, with fine to medium grained sand, trace of organic material	D				0.00: TOPSOIL
						0.25		CH	Silty CLAY, high plasticity, brown and orange, trace of fine to medium grained sand	VSt			x	
						0.50		SM	Silty SAND, fine to medium grained, grey, trace of high plasticity clay fines					
						1.00		CH	Silty CLAY, high plasticity, grey and orange, fine to medium grained sand becoming orange	M			x	
						1.50		CH	Silty CLAY, high plasticity, pale brown and pale grey, with fine to medium grained sand	St			x	
						2.00			Hole Terminated at 2.00 m Target depth					
						2.50								
						3.00								
						3.50								
						4.00								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 18:00 10.01.00.01 Datagel Lab and In Situ Tool - DSD [Lib: Tectonic 2.00.2 2016-10-13 Pj]: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 24/09/2019		
Project Name: MIBA - North Harbour	Completed: 24/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 499466.0 m E 7001208.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations	
AD/T	Groundwater inflow at 0.6m	ASS Samples at 0.25m Intervals to 2.0m			0.00		CH	Sandy CLAY (TOPSOIL), high plasticity, dark grey, fine to medium grained sand, with organic material	St				0.00: TOPSOIL	
					0.25		CH	Silty CLAY, high plasticity, brown and dark brown, with fine to medium grained sand	VSt					
					0.50		SC	Clayey SAND, fine to medium grained, dark grey, high plasticity clay fines						0.50: Perched water
					1.00		SM	Silty SAND, fine to medium grained, orange and brown, trace of high plasticity clay fines	M					
					1.50		CH	Silty CLAY, high plasticity, orange and brown, with fine to medium grained sand	St					
					2.00			becoming orange and grey						
					2.00			Hole Terminated at 2.00 m Target depth						
					2.50									
					3.00									
					3.50									
					4.00									

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 18:01 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pjt: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 24/09/2019		
Project Name: MIBA - North Harbour	Completed: 24/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 499483.0 m E 7001060.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 2.0m			0.00		SP	SAND, fine to medium grained, pale grey, trace of organic material	D			100	0.00: TOPSOIL
						0.10		SP	SAND, fine to medium grained, pale grey				200	
						1.00			becoming fine to coarse grained, grey	M			300	
						1.50		SC	Clayey SAND, fine to medium grained, grey, high plasticity clay fines				400	
2.00		CH	Silty CLAY, high plasticity, pale grey, trace of fine to medium grained sand	St			500	x						
2.00			Hole Terminated at 2.00 m Target depth											
						2.50								
						3.00								
						3.50								
						4.00								

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 18:01 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pjt: Tectonic 2.00 2016-02-16

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 24/09/2019		
Project Name: MIBA - North Harbour	Completed: 24/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 499372.0 m E 7000989.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations			
Method	Penetration	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	[Hatched]	ASS Samples at 0.25m Intervals to 2.0m	[Dashed]	[Dashed]	0.5	[Hatched]	SP	SAND, fine to medium grained, pale grey, trace of organic material	D	[Dashed]	[Dashed]	100	0.00: TOPSOIL
						[Hatched]	SP	SAND, fine to medium grained, pale grey					
						[Dashed]		becoming coarser, trace of fine sized rounded gravel	M				
						[Dashed]		becoming fine to coarse grained	W				
					2.0	[X]	CH	Silty CLAY, high plasticity, dark grey and brown, trace of fine to medium grained sand		VSt	*		
					2.00			Hole Terminated at 2.00 m Target depth					

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 18:02 10.01.00.01 Datagel Lab and In Situ Tool - DSD [Lib: Tectonic 2.00.2 2016-10-13 Pjt: Tectonic 2.00 2016-02-16

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>[Hatched] Core recovered (hatching indicates material) [Dashed] Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 27/09/2019		
Project Name: MIBA - North Harbour	Completed: 27/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 499276.0 m E 7001109.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations			
Method	Penetration	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Groundwater inflow at 1.5m	ASS Samples at 0.25m Intervals to 2.0m			0.0		SM	Silty SAND (TOPSOIL), fine to medium grained, trace of organic material	D				0.00: TOPSOIL
					0.25	SM	Silty SAND, fine to medium grained, pale brown						
					1.0			becoming grey, trace of organic material	M				
					1.5	SC	Clayey SAND, fine to medium grained, dark grey, high plasticity clay fines, trace of organic material						
2.0	CH	Silty CLAY, high plasticity, pale grey and brown											
					2.0			Hole Terminated at 2.00 m Target depth					

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 18:02 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pjt: Tectonic 2.00 2016-02-16

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 27/09/2019		
Project Name: MIBA - North Harbour	Completed: 27/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 499247.0 m E 7001269.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations			
Method	Penetration	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	[Hatched]	ASS Samples at 0.25m Intervals to 2.0m	[Hatched]		0.5	[Hatched]	SM	Silty SAND, fine to medium grained, pale brown, trace of organic material	D				0.00: TOPSOIL
						[Dotted]	SP	SAND, fine to medium grained, pale brown					
					1.0	[Dotted]		becoming pale grey					
					1.5	[Dotted]	SM	Silty SAND, fine to medium grained, pale grey	M				
					2.0	[X]		Hole Terminated at 2.00 m Target depth					
					2.5								
					3.0								
					3.5								
					4.0								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>[Hatched] Core recovered (hatching indicates material) [Dotted] Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 18:02 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 23/09/2019		
Project Name: MIBA - North Harbour	Completed: 23/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498958.0 m E 7001155.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 2.0m			0.00		SM	Silty SAND (TOPSOIL), fine grained, grey, trace of organic material	D	VSt			0.00: TOPSOIL
						0.25		SM	Silty SAND, fine to medium grained, brown, trace of high plasticity clay fines					
						0.50		CH	Sandy CLAY, high plasticity, orange, fine to medium grained sand					
						1.00			becoming orange and red					
						2.00			Hole Terminated at 2.00 m Target depth					

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 18:03 10.01.00.01 Datagel Lab and In Situ Tool - DSD [Lib: Tectonic 2.00.2 2016-10-13 Pj]: Tectonic 2.00 2016-02-16

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 23/09/2019		
Project Name: MIBA - North Harbour	Completed: 23/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498992.0 m E 7001376.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals			0.00		CH	Silty CLAY (TOPSOIL), high plasticity, dark brown, trace of organic material and fine grained sand	D				0.00: TOPSOIL
						0.25		CH	Silty CLAY, high plasticity, brown to pale brown, trace of fine grained sand	H				
						0.50			becoming pale grey and orange, trace of fine to medium grained sand	M				
						1.00								
						1.50								
						2.00			Hole Terminated at 2.00 m Target depth					
						2.50								
						3.00								
						3.50								
						4.00								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 18:03 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 23/09/2019		
Project Name: MIBA - North Harbour	Completed: 23/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 499039.0 m E 7001487.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 2.0m			0.0		CH	Silty CLAY (TOPSOIL), high plasticity, dark brown, trace of organic material	D				0.00: TOPSOIL
						0.5		CH	Silty CLAY, high plasticity, dark brown	H				
						1.0			becoming grey and brown, trace of fine to medium grained sand	M	VSt			
						1.5			with fine to medium grained sand		St			
						2.0			Hole Terminated at 2.00 m Target depth					
						2.5								
						3.0								
						3.5								
						4.0								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p>Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 18:03 10.01.00.01 Datagel Lab and In Situ Tool - DSD [Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16]

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 26/09/2019		
Project Name: MIBA - North Harbour	Completed: 26/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498840.0 m E 7001627.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 2.0m			0.00		SM	Silty SAND (TOPSOIL), fine to medium grained sand, brown, trace of organic material	D				0.00: TOPSOIL
						0.25		CH	Silty CLAY, high plasticity, red and brown, trace of fine to medium grained sand	H			x	
						0.50			becoming brown and red, without sand				x	
						1.00			becoming grey	M			x	
						1.50				St				
						2.00			becoming red and grey, trace of fine to medium grained sand				x	
						2.00			Hole Terminated at 2.00 m Target depth					
						2.50								
						3.00								
						3.50								
						4.00								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 18:04 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pjt: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 26/09/2019		
Project Name: MIBA - North Harbour	Completed: 26/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498704.0 m E 7001418.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations					
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations	
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 1.6m			0.00		SM	Silty SAND (TOPSOIL), fine to medium grained, grey, trace of organic material	D				0.00: TOPSOIL	
						0.25		SM	Silty SAND, fine to medium grained, grey						
						0.50		CH	Silty CLAY, high plasticity, brown and orange, with fine to medium grained sand	M	St		x		
						1.00		SC	Clayey SAND, fine to medium grained, grey, high plasticity clay fines						x
						1.60								Hole Terminated at 1.60 m Target depth	
						2.00									
						2.50									
						3.00									
						3.50									
						4.00									

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 18:04 10.01.00.01 Datagel Lab and In Situ Tool - DGD [Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 26/09/2019		
Project Name: MIBA - North Harbour	Completed: 26/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498400.0 m E 7001212.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 2.0m			0.00		SM	Silty SAND (TOPSOIL), high plasticity, grey, trace of organic material	D	D			0.00: TOPSOIL
						0.25		SM	Silty SAND, fine to medium grained, grey, without organic					
						0.50								
						1.00		CH	Sandy CLAY, high plasticity, grey and red, fine to medium grained sand	M	MD		x	
						1.50			becoming brown				x	
						2.00			Hole Terminated at 2.00 m Target depth					
						2.50								
						3.00								
						3.50								
						4.00								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 18:04 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 26/09/2019		
Project Name: MIBA - North Harbour	Completed: 26/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498348.0 m E 7001391.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 2.0m			0.00		SM	Silty SAND (TOPSOIL), fine to medium grained, grey, trace of organic material	D				0.00: TOPSOIL
						0.25		SC	Clayey SAND, fine to medium grained, brown, high plasticity clay	D to M				
						0.50		CH	Sandy CLAY, high plasticity, brown and orange, fine to medium grained sand	M	St			
						2.00			Hole Terminated at 2.00 m Target depth					

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 18:05 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 24/09/2019		
Project Name: MIBA - North Harbour	Completed: 24/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498461.0 m E 7002233.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations							
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations			
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 2.0m			0.0		ML	Sandy SILT (TOPSOIL), low liquid limit, grey, fine grained sand, trace of organic material	D					0.00: TOPSOIL		
						0.25		CH	Silty CLAY, high plasticity, dark brown and brown, trace of fine to medium grained sand	D to M	H						
						0.5			becoming brown, without sand								
						1.0			becoming brown and orange		M	St					
						1.5			becoming brown and red								
						2.0			Hole Terminated at 2.00 m Target depth								
						2.5											
						3.0											
						3.5											
						4.0											

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 18:05 10.01.00.01 Datagel Lab and In Situ Tool - DSD [Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client: North Harbour Holdings Pty Ltd.	Commenced: 24/09/2019		
Project Name: MIBA - North Harbour	Completed: 24/09/2019		
Hole Location:	Logged By: BZ		
Hole Position: 498419.0 m E 7002043.0 m N MGA94 Zone 56	Checked By: ACD		
Drill Model and Mounting: Edson CP1	Inclination: -90°	RL Surface: No survey	
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD	Operator:

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 2.0m			0.00		CH	Silty CLAY (TOPSOIL), high plasticity, brown, trace of organic material and fine to medium grained sand	D	H			0.00: TOPSOIL
						0.25		CH	Silty CLAY, high plasticity, brown, trace of fine to medium grained sand and fine sized rounded gravel	D to M	H			
						0.50			becoming brown and red, without gravel	M	VSt			
						1.00			becoming grey and brown, without sand					
						1.50					St			
						2.00			Hole Terminated at 2.00 m Target depth					
						2.50								
						3.00								
						3.50								
						4.00								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 18:06 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 19210

Client:	North Harbour Holdings Pty Ltd.	Commenced:	24/09/2019
Project Name:	MIBA - North Harbour	Completed:	24/09/2019
Hole Location:		Logged By:	BZ
Hole Position:	498205.0 m E 7001997.0 m N MGA94 Zone 56	Checked By:	ACD
Drill Model and Mounting:	Edson CP1	Inclination:	-90°
Hole Diameter:	100 mm	Bearing:	360°
		RL Surface:	No survey
		Datum:	AHD
		Operator:	

Drilling Information				Soil Description						Observations				
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency	Relative Density	Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T	Not Encountered		ASS Samples at 0.25m Intervals to 2.0m			0.00		CH	Silty CLAY (TOPSOIL), high plasticity, brown, trace of organic material	D				0.00: TOPSOIL
						0.25		CH	Silty CLAY, high plasticity, brown	H				
						0.50								
						1.00			becoming brown and red	VSt				
						1.50				M				
						2.00			becoming pale brown	St				
						2.00			Hole Terminated at 2.00 m Target depth					
						2.50								
						3.00								
						3.50								
						4.00								

<p>Method</p> <p>AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger</p>	<p>Penetration</p> <p>No resistance ranging to refusal</p>	<p>Water</p> <p>Level (Date) Inflow Partial Loss Complete Loss</p>	<p>Samples and Tests</p> <p>U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test</p>	<p>Moisture Condition</p> <p>D - Dry M - Moist W - Wet</p>	<p>Consistency/Relative Density</p> <p>VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense</p>
<p>Graphic Log/Core Loss</p> <p> Core recovered (hatching indicates material) Core loss</p>	<p>Classification Symbols and Soil Descriptions</p> <p>Based on Unified Soil Classification System</p>	<p>Plastic Limit</p> <p>< PL = PL > PL</p>			

TECTONIC 2.00.2 LIB.GLB Log 1 TECTONIC BOREHOLE 19210.GPJ <DrawingFile>> 01/10/2019 18:06 10.01.00.01 Datagel Lab and In Situ Tool - DSD | Lib: Tectonic 2.00.2 2016-10-13 Pj: Tectonic 2.00 2016-02-16

Engineering Log - Borehole

Project No.: 17348

Client: North East Business Park	Commenced: 11/10/2017
Project Name: Sewer Trunk Main and Pump Station	Completed: 11/10/2017
Hole Location: Buckley-Ulmann Road, North Harbour	Logged By: MT
Hole Position: 499434.0 m E 7000692.0 m N MGA94 Zone 56	Checked By: ACD

Drill Model and Mounting: 4WD Auger	Inclination: -90°	RL Surface: 1.40 m
Hole Diameter: 100 mm	Bearing: 360°	Datum: AHD
		Operator: Contract Drilling

Drilling Information				Soil Description						Observations			
Method	Penetration	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description soil type: plasticity or particle characteristics, secondary and minor components, colour	Moisture Condition	Consistency Relative Density	Pocket Penetrometer UCS (kPa)	STRUCTURE & Other Observations
AD/T	[Hatching]	11/10/17, Groundwater level at 0.6m	ASS Samples at 0.25m Intervals to 5m	[Hatching]	-0.4	1	[Hatching]	CH	Silty CLAY, high plasticity, dark brown, organics and silt fines	M	St	[Scale]	0.00: Alluvium (Marine)
			SPT 1,1,1 N=2					CH	Silty CLAY, high plasticity, grey mottled brown (10%)				0.30: DPP = 90-100kPa
									becoming grey, mottle ceases				0.90: DPP = 80-90kPa
													1.30: DPP = 90-100kPa
													1.60: DPP = 25kPa
													2.00: DPP = 25kPa
													2.40: DPP = 10-15kPa
			2.95: PP = 25-50kPa										
			U50 2.5-2.95m		-0.6	2				W	VS		
			SPT HW,HW,1 N=1		-2.6	4			trace of fine to coarse grained sand				4.00: DPP < 25kPa
					-3.6	5			some fine to coarse grained sand				5.00: DPP < 50kPa
					-4.6	6			becoming pale grey, trace of fine to coarse grained sand				5.50: DPP = 120-150kPa
			SPT 2,3,4 N=7		-4.6	6			becoming mottled red orange	M	St		6.20: DPP = 180-200kPa
					-5.6	7			Hole Terminated at 6.45 m Target depth				

Method AD/T - Auger Drilling TC Bit RR - Rock Roller RD - Rotary Drilling NMLC - Rock Core HA - Hand Auger	Penetration No resistance ranging to refusal [Hatching]	Water Level (Date) Inflow Partial Loss Complete Loss	Samples and Tests U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test	Moisture Condition D - Dry M - Moist W - Wet	Consistency/Relative Density VS - Very Soft S - Soft F - Firm VSt - Very Stiff H - Hard VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
Graphic Log/Core Loss Core recovered (hatching indicates material) Core loss	Classification Symbols and Soil Descriptions Based on Unified Soil Classification System	Plastic Limit < PL = PL < PL			

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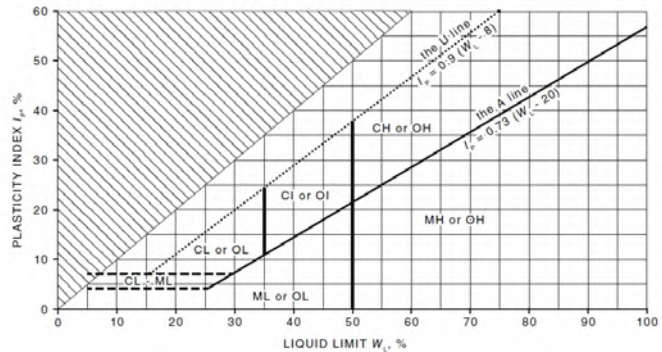
CLASSIFICATION AND INFERRED STRATIGRAPHY

Soil is classified and described in borehole and test pit logs using the preferred method given in AS1726 – 2017. The material properties are assessed in the field by visual/tactile methods.

Particle Size

Plasticity Properties

Major Division	Sub Division	Particle Size
BOULDERS		> 200 mm
COBBLES		63 to 200 mm
GRAVEL	Coarse	19 to 63 mm
	Medium	6.7 to 19 mm
	Fine	2.36 to 6.7 mm
SAND	Coarse	0.6 to 2.36 mm
	Medium	0.21 to 0.6 mm
	Fine	0.075 to 0.21
SILT		0.002 to 0.075
CLAY		< 0.002 mm



NOTE: The U line is an approximate upper bound for most materials. Data which plot above the U line may represent unusual/problem soil behavior, or unreliable data and should be considered carefully.

MOISTURE CONDITION

AS1726 - 2017

Symbol	Term	Description
D	Dry	Sands and gravels are free flowing. Clays & Silts may be brittle or friable and powdery.
M	Moist	Soils are darker than in the dry condition & may feel cool. Sands and gravels tend to cohere.
W	Wet	Soils exude free water. Sands and gravels tend to cohere.

CONSISTENCY AND DENSITY

AS1726 - 2017

Symbol	Term	Undrained Shear Strength	Symbol	Term	Density Index %	SPT "N" #
VS	Very Soft	0 to 12 kPa	VL	Very Loose	Less than 15	0 to 4
S	Soft	12 to 25 kPa	L	Loose	15 to 35	4 to 10
F	Firm	25 to 50 kPa	MD	Medium Dense	35 to 65	10 to 30
St	Stiff	50 to 100 kPa	D	Dense	65 to 85	30 to 50
VSt	Very Stiff	100 to 200 kPa	VD	Very Dense	Above 85	Above 50
H	Hard	Above 200 kPa				

In the absence of test results, consistency and density may be assessed from correlations with the observed behaviour of the material.

SPT correlations are not stated in AS1726 – 2017, and may be subject to corrections for overburden pressure and equipment type.

Engineering Log - Excavation

client: **NORTH EAST BUSINESS PARK**

principal:

project: **NORTH EAST BUSINESS PARK - ASSMP**

location: **REFER TO PLAN**

Excavation ID: **TP301**

sheet: 1 of 1

project no. **GEOTKPAR01976AC**

date excavated: **08 Jul 2015**

date completed: **08 Jul 2015**

logged by: **AS**

checked by: **MT**

position: E: 498679; N: 7000675 (MGA94 Zone 56 J) surface elevation : Not Specified pit orientation:
 equipment type: 8T Excavator excavation method: excavation dimensions: 3.0 m long 0.5 m wide

excavation information				material substance									
method	support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
N				ASS		0.0		CH	Sandy CLAY: high plasticity, brown, fine to medium grained sand, trace of silt.	M	L		TOPSOIL
				ASS		0.5		CH	Sandy CLAY: high plasticity, pale brown, orange/red mottle, fine to medium grained sand. ... colour changing to grey, orange/red mottle, fine to medium grained sand		F / St		DIST PP = 150-200kPa DIST PP = 150-200kPa
				ASS		1.0		SC	Clayey SAND fine to coarse grained, grey, orange mottle, high plastic clay fines.		St		
				ASS		1.5					D		Some lenses of HP clay with DPP=150kPa
				ASS		2.0			Test pit TP301 terminated at 2.0 m	W			LIMIT OF INVESTIGATION
				ASS		2.5							
				ASS		3.0							
				ASS		3.5							
				ASS		4.0							
				ASS		4.5							
				ASS		5.0							
				ASS		5.5							
				ASS		6.0							

image:

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method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	penetration no resistance ranging to refusal water 10-Oct-12 water level on date shown water inflow water outflow	samples & field tests U## undisturbed sample ##mm diameter D disturbed sample B bulk disturbed sample E environmental sample HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane sheapeak/remoulded (uncorrected kPa) R refusal	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

client: **NORTH EAST BUSINESS PARK**

principal:

project: **NORTH EAST BUSINESS PARK - ASSMP**

location: **REFER TO PLAN**

Excavation ID: **TP305**

sheet: 1 of 1

project no. **GEOTKPAR01976AC**

date excavated: **09 Jul 2015**

date completed: **09 Jul 2015**

logged by: **AS**

checked by: **MT**

position: E: 498420; N: 7000164 (MGA94 Zone 56 J) surface elevation : Not Specified pit orientation:
 equipment type: 8T Excavator excavation method: excavation dimensions: 3.0 m long 0.5 m wide

excavation information				material substance									
method	support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
N		1		ASS		0.0		SM	Silty SAND fine to medium grained, dark brown, trace of clay fines and organics.	M	MD	100	TOPSOIL
		2		ASS		0.5		SC	Clayey SAND fine to medium grained, brown, orange mottle, low to high plastic clay fines. ... colour changing to pale grey, orange mottle			200	
		3		ASS		1.0		SC	Clayey SAND fine to coarse grained, grey, orange/brown mottle, low to high plastic clay fines.			300	
			Not Observed	ASS		1.5						400	
				ASS		2.0			Test pit TP305 terminated at 2.0 m			400	LIMIT OF INVESTIGATION
				ASS		2.5						400	
				ASS		3.0						400	
				ASS		3.5						400	
				ASS		4.0						400	
				ASS		4.5						400	
				ASS		5.0						400	
				ASS		5.5						400	
				ASS		6.0						400	

image:

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	penetration no resistance ranging to refusal water 10-Oct-12 water level on date shown water inflow water outflow	samples & field tests U## undisturbed sample ##mm diameter D disturbed sample B bulk disturbed sample E environmental sample HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane sheapeak/remoulded (uncorrected kPa) R refusal	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

client: **NORTH EAST BUSINESS PARK**

principal:

project: **NORTH EAST BUSINESS PARK - ASSMP**

location: **REFER TO PLAN**

Excavation ID: **TP306**

sheet: 1 of 1

project no. **GEOTKPAR01976AC**

date excavated: **09 Jul 2015**

date completed: **09 Jul 2015**

logged by: **AS**

checked by: **MT**

position: E: 498455; N: 7000220 (MGA94 Zone 56 J) surface elevation : Not Specified pit orientation:
 equipment type: 8T Excavator excavation method: excavation dimensions: 3.0 m long 0.5 m wide

excavation information				material substance							
method	support	penetration	water	samples & field tests	RL (m)	depth (m)	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
N		1, 2, 3	Not Observed	ASS		0.0	Sandy CLAY: high plasticity, dark brown, fine to medium grained sand, trace of silt and organics.	M	L	100	TOPSOIL
				ASS		0.5	Clayey SAND fine to coarse grained, dark grey, high plastic clay fines.		F / St	200	DIST PP = 100-150kPa DIST PP = 100-150kPa DIST PP = 300-350kPa DIST PP = 300-350kPa DIST PP = 350-400kPa DIST PP = 350-400kPa XW MATERIAL
				ASS		1.0	Sandy CLAY: high plasticity, grey, red/orange mottle, fine to coarse grained sand.		VSt	300	
				ASS		1.5	Sandy CLAY: high plasticity, grey, red/orange mottle, fine to coarse grained sand.		VSt / H	400	
				ASS		2.0	Clayey SAND fine to coarse grained, pale grey, red/orange mottle, fine to coarse grained sand.		VD	400	
				ASS		2.0	Test pit TP306 terminated at 2.0 m				LIMIT OF INVESTIGATION



method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	penetration no resistance ranging to refusal water 10-Oct-12 water level on date shown water inflow water outflow	samples & field tests U## undisturbed sample ##mm diameter D disturbed sample B bulk disturbed sample E environmental sample HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shearpeak/remoulded (uncorrected kPa) R refusal	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

client: **NORTH EAST BUSINESS PARK**

principal:

project: **NORTH EAST BUSINESS PARK - ASSMP**

location: **REFER TO PLAN**

Excavation ID: **TP307**

sheet: 1 of 1

project no. **GEOTKPAR01976AC**

date excavated: **09 Jul 2015**

date completed: **09 Jul 2015**

logged by: **AS**

checked by: **MT**

position: E: 498471; N: 7000284 (MGA94 Zone 56 J) surface elevation : Not Specified pit orientation:
 equipment type: 8T Excavator excavation method: excavation dimensions: 3.0 m long 0.5 m wide

excavation information				material substance							
method	support	penetration	water	samples & field tests	RL (m)	depth (m)	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
N		1 2 3	Not Observed	ASS ASS ASS ASS ASS ASS ASS		1.0	Sandy CLAY: high plasticity, dark brown, fine to medium grained sand, trace of silt and organics. CLAY: high plasticity, pale grey/pale brown, orange mottle, fine to medium grained sand, trace of silt. ... colour changing to grey, with some fine to medium grained sand	M	L	100 200 300 400	TOPSOIL DIST PP = 150-200kPa DIST PP = 150-200kPa DIST PP = 200-300kPa DIST PP = 200-300kPa DIST PP = 250-300kPa DIST PP = 250-300kPa XW MATERIAL Observed XW Sandstone
						2.0	Clayey SAND fine to coarse grained, grey, orange/red mottle, high plastic clay fines, trace of fine to medium grained gravel.		VD		LIMIT OF INVESTIGATION
						2.0	Test pit TP307 terminated at 2.0 m				

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method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	penetration no resistance ranging to refusal water 10-Oct-12 water level on date shown water inflow water outflow	samples & field tests U## undisturbed sample ##mm diameter D disturbed sample B bulk disturbed sample E environmental sample HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane sheapeak/remoulded (uncorrected kPa) R refusal	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet W _P plastic limit W _L liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

client: **NORTH EAST BUSINESS PARK**

principal:

project: **NORTH EAST BUSINESS PARK - ASSMP**

location: **REFER TO PLAN**

Excavation ID: **TP308**

sheet: 1 of 1

project no. **GEOTKPAR01976AC**

date excavated: **09 Jul 2015**

date completed: **09 Jul 2015**

logged by: **AS**

checked by: **MT**

position: E: 498483; N: 7000351 (MGA94 Zone 56 J) surface elevation : Not Specified pit orientation:
 equipment type: 8T Excavator excavation method: excavation dimensions: 3.0 m long 0.5 m wide

excavation information				material substance									
method	support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
N		1, 2, 3	Not Observed	ASS		1.0		SC	Clayey SAND fine to medium grained, dark brown, high plasticity clay fines, trace of silt and organics.	M	F / St		TOPSOIL
				ASS				CH	Sandy CLAY: high plasticity, grey/brown, orange mottle, fine to coarse grained sand.		VSt		DIST PP = 250-300kPa
				ASS				CH	CLAY: low to high plasticity, grey, with some fine to medium grained sand, trace of silt.		VSt / H		DIST PP = 250-300kPa
				ASS				CH	Sandy CLAY: low to high plasticity, grey, orange mottle, fine to coarse grained sand.				DIST PP = 250-300kPa
				ASS				SC	Clayey SAND fine to coarse grained, grey, orange/red mottle, clay fines.		VD		XW MATERIAL
						2.0			Test pit TP308 terminated at 1.85 m				XW Sandstone - residual material
						3.0							LIMIT OF INVESTIGATION - EXCAVATOR REFUSAL
						4.0							
						5.0							
						6.0							

image:

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method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	penetration no resistance ranging to refusal water 10-Oct-12 water level on date shown water inflow water outflow	samples & field tests U## undisturbed sample ##mm diameter D disturbed sample B bulk disturbed sample E environmental sample HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane sheapeak/remounded (uncorrected kPa) R refusal	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

client: **NORTH EAST BUSINESS PARK**

principal:

project: **NORTH EAST BUSINESS PARK - ASSMP**

location: **REFER TO PLAN**

Excavation ID: **TP309**

sheet: 1 of 1

project no. **GEOTKPAR01976AC**

date excavated: **09 Jul 2015**

date completed: **09 Jul 2015**

logged by: **AS**

checked by: **MT**

position: E: 498500; N: 7000419 (MGA94 Zone 56 J) surface elevation : Not Specified pit orientation:
 equipment type: 8T Excavator excavation method: excavation dimensions: 3.0 m long 0.5 m wide

excavation information				material substance									
method	support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
N		1		ASS	1.0	1.0		SC	Clayey SAND fine to medium grained, dark brown, clay fines, trace of silt and organics. CLAY: high plasticity, grey, yellow/brown mottle, trace of fine to medium grained sand.	M	L		TOPSOIL DIST PP = 150-200kPa DIST PP = 150-200kPa DIST PP = 250-300kPa DIST PP = 250-300kPa DIST PP = 250-300kPa DIST PP = 250-300kPa DIST PP = 350kPa DIST PP = 350kPa XW MATERIAL LIMIT OF INVESTIGATION
				CH				St					
				ASS		2.0		SC	Clayey SAND fine to coarse grained, grey, orange mottle, high plastic clay fines. Test pit TP309 terminated at 2.0 m		VD		

image:

method	penetration	samples & field tests	classification symbol & soil description	consistency / relative density
N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	<p>no resistance ranging to refusal</p> <p>10-Oct-12 water level on date shown</p> <p>water inflow</p> <p>water outflow</p>	U## undisturbed sample ##mm diameter D disturbed sample B bulk disturbed sample E environmental sample HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane sheapeak/remoulded (uncorrected kPa) R refusal	based on Unified Classification System moisture D dry M moist W wet W _p plastic limit W _L liquid limit	VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

Engineering Log - Excavation

client: **NORTH EAST BUSINESS PARK**

principal:

project: **NORTH EAST BUSINESS PARK - ASSMP**

location: **REFER TO PLAN**

Excavation ID: **TP315**

sheet: 1 of 1

project no. **GEOTKPAR01976AC**

date excavated: **08 Jul 2015**

date completed: **08 Jul 2015**

logged by: **AS**

checked by: **MT**

position: E: 498631; N: 7000736 (MGA94 Zone 56 J) surface elevation : Not Specified pit orientation:
 equipment type: 8T Excavator excavation method: excavation dimensions: 3.0 m long 0.5 m wide

excavation information				material substance									
method	support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
N		1, 2, 3		ASS		0.0 - 1.0		CH	Sandy CLAY: low to high plasticity, brown, fine to medium grained sand, organics, trace of silt.	M	S / F		TOPSOIL
				ASS		1.0 - 1.5		CH	Sandy CLAY: high plasticity, orange brown, red/orange mottle, fine to medium grained sand. ... colour changing to orange brown, orange mottle		St	100, 200, 300, 400	DIST PP = 100-150kPa DIST PP = 100-150kPa
				ASS		1.5 - 2.0		SC	Clayey SAND fine to medium grained, dark grey, low to high plastic clay fines.	W	MD / D		DIST PP = 100-150kPa DIST PP = 100-150kPa
				ASS		2.0 - 6.0			Test pit TP315 terminated at 2.0 m				LIMIT OF INVESTIGATION

image:

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	penetration no resistance ranging to refusal	samples & field tests U## undisturbed sample ##mm diameter D disturbed sample B bulk disturbed sample E environmental sample HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane sheapeak/remoulded (uncorrected kPa) R refusal	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

client: **NORTH EAST BUSINESS PARK**

principal:

project: **NORTH EAST BUSINESS PARK - ASSMP**

location: **REFER TO PLAN**

Excavation ID: **TP316**

sheet: 1 of 1

project no. **GEOTKPAR01976AC**

date excavated: **08 Jul 2015**

date completed: **08 Jul 2015**

logged by: **AS**

checked by: **MT**

position: E: 498551; N: 7000763 (MGA94 Zone 56 J) surface elevation : Not Specified pit orientation:
 equipment type: 8T Excavator excavation method: excavation dimensions: 3.0 m long 0.5 m wide

excavation information				material substance									
method	support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
N		1		ASS		0.0		SM	Silty SAND fine to medium grained, dark brown, trace of clay fines, organics.	D	L		TOPSOIL
		2		ASS		0.5		SC	Clayey SAND fine to medium grained, grey/brown, orange mottle, high plastic clay fines.	M	MD		XW MATERIAL DIST PP = 100-150kPa DIST PP = 100-150kPa
		3		ASS		1.0		CH	Sandy CLAY : high plasticity, grey, orange mottle, fine to coarse grained sand.		St		
				ASS		1.5		SC	Clayey SAND fine to coarse grained, grey, low to high plastic fines.		VD		
				ASS		2.0			Test pit TP316 terminated at 2.0 m				

image:

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	penetration no resistance ranging to refusal water 10-Oct-12 water level on date shown water inflow water outflow	samples & field tests U## undisturbed sample ##mm diameter D disturbed sample B bulk disturbed sample E environmental sample HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane sheapeak/remoulded (uncorrected kPa) R refusal	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

client: **NORTH EAST BUSINESS PARK**

principal:

project: **NORTH EAST BUSINESS PARK - ASSMP**

location: **REFER TO PLAN**

Excavation ID: **TP318**

sheet: 1 of 1

project no. **GEOTKPAR01976AC**

date excavated: **08 Jul 2015**

date completed: **08 Jul 2015**

logged by: **AS**

checked by: **MT**

position: E: 498510; N: 7000828 (MGA94 Zone 56 J) surface elevation : Not Specified pit orientation:
 equipment type: 8T Excavator excavation method: excavation dimensions: 3.0 m long 0.5 m wide

excavation information				material substance									
method	support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
N		1 2 3	Not Observed	ASS		0.0		SM	Silty SAND fine to medium grained, dark brown, trace of clay fines, organics.	M	L / MD		TOPSOIL
				ASS		0.2		SM					RESIDUAL
				ASS		0.4		SC	Silty SAND fine to medium grained, grey/brown.		MD / D		
				ASS		0.6			Clayey SAND fine to coarse grained, grey, orange/brown mottle, high plastic clay fines. ... colour changing to grey, red/brown mottle				
				ASS		0.8							
				ASS		1.0							
				ASS		1.2		CH	Sandy CLAY : high plasticity, grey, yellow/brown mottle, fine to coarse grained sand.		VSt	100 200 300 400	
						2.0			Test pit TP318 terminated at 2.0 m				

image:

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	penetration no resistance ranging to refusal water 10-Oct-12 water level on date shown water inflow water outflow	samples & field tests U## undisturbed sample ##mm diameter D disturbed sample B bulk disturbed sample E environmental sample HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane sheapeak/remoued (uncorrected kPa) R refusal	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

client: **NORTH EAST BUSINESS PARK**

principal:

project: **NORTH EAST BUSINESS PARK - ASSMP**

location: **REFER TO PLAN**

Excavation ID: **TP319**

sheet: 1 of 1

project no. **GEOTKPAR01976AC**

date excavated: **08 Jul 2015**

date completed: **08 Jul 2015**

logged by: **AS**

checked by: **MT**

position: E: 498561; N: 7000878 (MGA94 Zone 56 J) surface elevation : Not Specified pit orientation:
 equipment type: 8T Excavator excavation method: excavation dimensions: 3.0 m long 0.5 m wide

excavation information				material substance									
method	support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
N		1		ASS		0.0		SC	Clayey SAND fine to medium grained, dark grey, trace of silt, organics.	M	L		TOPSOIL
		2		ASS		1.0		CH	Sandy CLAY : low to high plasticity, grey/brown, orange mottle, fine to coarse grained sand. ...orange mottle increasing		St	200	DIST PP = 200kPa DIST PP = 200kPa Some lenses of SP fine to coarse grained sand
		3		ASS		2.0		SC	Silty SAND fine to coarse grained, grey, orange mottle, low to high plastic clay fines.		D / VD	300	XW MATERIAL Observed some XW Sandstone
				ASS		2.0			Test pit TP319 terminated at 2.0 m				LIMIT OF INVESTIGATION

image:

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	penetration no resistance ranging to refusal water 10-Oct-12 water level on date shown water inflow water outflow	samples & field tests U## undisturbed sample ##mm diameter D disturbed sample B bulk disturbed sample E environmental sample HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane sheapeak/remoulded (uncorrected kPa) R refusal	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

client: **NORTH EAST BUSINESS PARK**

principal:

project: **NORTH EAST BUSINESS PARK - ASSMP**

location: **REFER TO PLAN**

Excavation ID: **TP334**

sheet: 1 of 1

project no. **GEOTKPAR01976AC**

date excavated: **07 Jul 2015**

date completed: **07 Jul 2015**

logged by: **MC**

checked by: **MT**

position: E: 499171; N: 7000784 (MGA94 Zone 56 J) surface elevation : Not Specified pit orientation: E-W
 equipment type: 8T Excavator excavation method: excavation dimensions: 3.0 m long 0.5 m wide

excavation information				material substance									
method	support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
N				ASS		0.0		CH	Silty CLAY: high plasticity, dark brown, trace of fine grained sand.	M	F / St		TOPSOIL
				ASS		0.2		CH	CLAY: high plasticity, orange brown, trace of fine grained sand. ... colour changing to grey, orange/brown mottle		St		Small roots observed in top 400mm
				ASS		0.4							DIST PP = 110kPa
				ASS		0.6							
				ASS		0.8							
				ASS		1.0		SP	SAND: fine to coarse grained, grey, with some medium to high plastic fines, with some fine to medium grained rounded gravel.		MD		
				ASS		1.2							
				ASS		1.4							
				ASS		1.6							
				ASS		1.8							
				ASS		2.0							
						2.0			Test pit TP334 terminated at 2.0 m				LIMIT OF INVESTIGATION
						3.0							
						4.0							
						5.0							
						6.0							

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method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	penetration no resistance ranging to refusal water 10-Oct-12 water level on date shown water inflow water outflow	samples & field tests U## undisturbed sample ##mm diameter D disturbed sample B bulk disturbed sample E environmental sample HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane sheapeak/remoulded (uncorrected kPa) R refusal	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Excavation

client: **NORTH EAST BUSINESS PARK**

principal:

project: **NORTH EAST BUSINESS PARK - ASSMP**

location: **REFER TO PLAN**

Excavation ID: **TP336**

sheet: 1 of 1

project no. **GEOTKPAR01976AC**

date excavated: **07 Jul 2015**

date completed: **07 Jul 2015**

logged by: **MC**

checked by: **MT**

position: E: 499266; N: 7000787 (MGA94 Zone 56 J) surface elevation : Not Specified pit orientation: E-W
 equipment type: 8T Excavator excavation method: excavation dimensions: 3.0 m long 0.5 m wide

excavation information				material substance									
method	support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
N				ASS		0.0		CH	Silty CLAY: high plasticity, dark brown, trace of sand.	M	F / St		TOPSOIL Numerous grass roots
				ASS		0.5		CH	CLAY: high plasticity, orange brown/grey, trace of fine to medium grained sand.		St	X	DIST PP = 90kPa
				ASS		1.0		CH	CLAY: high plasticity, grey.		St	X	DIST PP = 110kPa
				ASS		1.5		SC	Silty SAND: fine to coarse grained, grey, high plastic fines, with some fine to medium grained rounded gravel.		D		
				ASS		2.0		SP					
				ASS		2.2		CH	SAND: fine to coarse grained, grey, with some high plastic fines, trace of fine grained rounded gravel.		VSt		
						3.0			Gravelly CLAY: high plasticity, grey, fine to medium grained rounded gravel, with some fine to coarse grained sand. Test pit TP336 terminated at 2.2 m				LIMIT OF INVESTIGATION



CDF_0_9_04BA.GLB Log COF EXCAVATION + PHOTO GK01976AC.GPJ <<DrawingFile>> 11/08/2015 11:15

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	penetration water 10-Oct-12 water level on date shown water inflow water outflow	samples & field tests U## undisturbed sample ##mm diameter D disturbed sample B bulk disturbed sample E environmental sample HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane sheapeak/remouded (uncorrected kPa) R refusal	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Soil Description Explanation Sheet (1 of 2)

DEFINITION:

In engineering terms soil includes every type of uncemented or partially cemented inorganic or organic material found in the ground. In practice, if the material can be remoulded or disintegrated by hand in its field condition or in water it is described as a soil. Other materials are described using rock description terms.

CLASSIFICATION SYMBOL & SOIL NAME

Soils are described in accordance with the Unified Soil Classification (UCS) as shown in the table on Sheet 2.

PARTICLE SIZE DESCRIPTIVE TERMS

NAME	SUBDIVISION	SIZE
Boulders		>200 mm
Cobbles		63 mm to 200 mm
Gravel	coarse	20 mm to 63 mm
	medium	6 mm to 20 mm
	fine	2.36 mm to 6 mm
Sand	coarse	600 μ m to 2.36 mm
	medium	200 μ m to 600 μ m
	fine	75 μ m to 200 μ m

MOISTURE CONDITION

Dry Looks and feels dry. Cohesive and cemented soils are hard, friable or powdery. Uncemented granular soils run freely through hands.

Moist Soil feels cool and darkened in colour. Cohesive soils can be moulded. Granular soils tend to cohere.

Wet As for moist but with free water forming on hands when handled.

CONSISTENCY OF COHESIVE SOILS

TERM	UNDRAINED STRENGTH S_u (kPa)	FIELD GUIDE
Very Soft	<12	A finger can be pushed well into the soil with little effort.
Soft	12 - 25	A finger can be pushed into the soil to about 25mm depth.
Firm	25 - 50	The soil can be indented about 5mm with the thumb, but not penetrated.
Stiff	50 - 100	The surface of the soil can be indented with the thumb, but not penetrated.
Very Stiff	100 - 200	The surface of the soil can be marked, but not indented with thumb pressure.
Hard	>200	The surface of the soil can be marked only with the thumbnail.
Friable	-	Crumbles or powders when scraped by thumbnail.

DENSITY OF GRANULAR SOILS

TERM	DENSITY INDEX (%)
Very loose	Less than 15
Loose	15 - 35
Medium Dense	35 - 65
Dense	65 - 85
Very Dense	Greater than 85

MINOR COMPONENTS

TERM	ASSESSMENT GUIDE	PROPORTION OF MINOR COMPONENT IN:
Trace of	Presence just detectable by feel or eye, but soil properties little or no different to general properties of primary component.	Coarse grained soils: <5% Fine grained soils: <15%
With some	Presence easily detected by feel or eye, soil properties little different to general properties of primary component.	Coarse grained soils: 5 - 12% Fine grained soils: 15 - 30%

SOIL STRUCTURE

ZONING		CEMENTING	
Layers	Continuous across exposure or sample.	Weakly cemented	Easily broken up by hand in air or water.
Lenses	Discontinuous layers of lenticular shape.	Moderately cemented	Effort is required to break up the soil by hand in air or water.
Pockets	Irregular inclusions of different material.		

GEOLOGICAL ORIGIN

WEATHERED IN PLACE SOILS

Extremely weathered material Structure and fabric of parent rock visible.

Residual soil Structure and fabric of parent rock not visible.

TRANSPORTED SOILS

Aeolian soil Deposited by wind.

Alluvial soil Deposited by streams and rivers.

Colluvial soil Deposited on slopes (transported downslope by gravity).

Fill Man made deposit. Fill may be significantly more variable between tested locations than naturally occurring soils.

Lacustrine soil Deposited by lakes.

Marine soil Deposited in ocean basins, bays, beaches and estuaries.

Soil Description Explanation Sheet (2 of 2)

SOIL CLASSIFICATION INCLUDING IDENTIFICATION AND DESCRIPTION

FIELD IDENTIFICATION PROCEDURES (Excluding particles larger than 60 mm and basing fractions on estimated mass)				USC	PRIMARY NAME	
COARSE GRAINED SOILS More than 50% of materials less than 63 mm is larger than 0.075 mm	GRAVELS More than half of coarse fraction is larger than 2.36 mm	CLEAN GRAVELS (Little or no fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes.	GW	GRAVEL	
		GRAVELS WITH FINES (Appreciable amount of fines)	Predominantly one size or a range of sizes with more intermediate sizes missing.	GP	GRAVEL	
		CLEAN SANDS (Little or no fines)	Non-plastic fines (for identification procedures see ML below)	GM	SILTY GRAVEL	
			Plastic fines (for identification procedures see CL below)	GC	CLAYEY GRAVEL	
	SANDS More than half of coarse fraction is smaller than 2.36 mm	CLEAN SANDS (Little or no fines)	Wide range in grain sizes and substantial amounts of all intermediate sizes	SW	SAND	
		SANDS WITH FINES (Appreciable amount of fines)	Predominantly one size or a range of sizes with some intermediate sizes missing.	SP	SAND	
		SANDS WITH FINES (Appreciable amount of fines)	Non-plastic fines (for identification procedures see ML below).	SM	SILTY SAND	
			Plastic fines (for identification procedures see CL below).	SC	CLAYEY SAND	
FINE GRAINED SOILS More than 50% of material less than 63 mm is smaller than 0.075 mm (A 0.075 mm particle is about the smallest particle visible to the naked eye)	IDENTIFICATION PROCEDURES ON FRACTIONS <0.2 mm.					
	SILTS & CLAYS Liquid limit less than 50	DRY STRENGTH	DILATANCY	TOUGHNESS		
		None to Low	Quick to slow	None	ML	SILT
		Medium to High	None	Medium	CL	CLAY
	SILTS & CLAYS Liquid limit greater than 50	Low to medium	Slow to very slow	Low	OL	ORGANIC SILT
		Low to medium	Slow to very slow	Low to medium	MH	SILT
		High	None	High	CH	CLAY
		Medium to High	None	Low to medium	OH	ORGANIC CLAY
HIGHLY ORGANIC SOILS	Readily identified by colour, odour, spongy feel and frequently by fibrous texture.			Pt	PEAT	

• Low plasticity – Liquid Limit w_L less than 35%. • Medium plasticity – w_L between 35% and 50%. • High plasticity – w_L greater than 50%.

COMMON DEFECTS IN SOIL

TERM	DEFINITION	DIAGRAM	TERM	DEFINITION	DIAGRAM
PARTING	A surface or crack across which the soil has little or no tensile strength. Parallel or sub parallel to layering (eg bedding). May be open or closed.		SOFTENED ZONE	A zone in clayey soil, usually adjacent to a defect in which the soil has a higher moisture content than elsewhere.	
JOINT	A surface or crack across which the soil has little or no tensile strength but which is not parallel or sub parallel to layering. May be open or closed. The term 'fissure' may be used for irregular joints <0.2 m in length.		TUBE	Tubular cavity. May occur singly or as one of a large number of separate or inter-connected tubes. Walls often coated with clay or strengthened by denser packing of grains. May contain organic matter	
SHEARED ZONE	Zone in clayey soil with roughly parallel near planar, curved or undulating boundaries containing closely spaced, smooth or slickensided, curved intersecting joints which divide the mass into lenticular or wedge shaped blocks.		TUBE CAST	Roughly cylindrical elongated body of soil different from the soil mass in which it occurs. In some cases the soil which makes up the tube cast is cemented.	
SHEARED SURFACE	A near planar curved or undulating, smooth, polished or slickensided surface in clayey soil. The polished or slickensided surface indicates that movement (in many cases very little) has occurred along the defect.		INFILLED SEAM	Sheet or wall like body of soil substance or mass with roughly planar to irregular near parallel boundaries which cuts through a soil mass. Formed by infilling of open joints.	

APPENDIX B

Table B1 – Summary of ASS Laboratory Testing ASS Laboratory Test Certificates

Table B1 - Summary of ASS Laboratory Testing

Location & Depth (m)		Soil Type	pH _F	AASS likelihood ¹	pH _{FOX}	PASS likelihood ²	Reaction 1 to 4	pH KCl	Titratable Actual Acidity mole H+ / t	S _{KCl} %S	Chromium Reducible Sulfur		S _{NAS} mole H+ / t	ANC _{bt} mole H+ / t	Net Acidity (Existing + Potential) mole H+ / t	Indicative Lime Rate		
			pH Unit		pH Unit			%S			mole H+ / t	kg CaCO ₃ /t				kg CaCO ₃ /m ³		
BH01	0.0-0.25		7.9	L	4.7	M	3											
	0.25-0.5		7.6	L	5.6	M	1	5.5	9	< 0.02	< 0.005	< 3	n/a	n/a	9	0.5	0.8	
	0.5-0.75		6.1	L	4.9	L	1											
	0.75-1.0		6.3	L	5.3	L	1											
	1.0-1.25		6.2	L	5.5	L	1											
	1.25-1.5		6.8	L	6.0	L	1	5.6	6.1	< 0.02	< 0.005	< 3	n/a	n/a	6.1	0.3	0.5	
	1.5-1.75		6.9	L	6.1	L	1											
BH02	0.0-0.25		6.3	L	3.4	M	2											
	0.25-0.5		5.3	L	3.4	M	3											
	0.5-0.75		5.5	L	4.5	L	2	4.4	35	< 0.02	< 0.005	< 3	< 10	n/a	35	1.8	3.0	
	0.75-1.0		5.5	L	4.1	L	2											
	1.0-1.25		5.8	L	4.6	L	2											
	1.25-1.5		5.8	L	5.0	L	2											
	1.5-1.75		5.9	L	4.6	L	2											
	1.75-2.0		5.7	L	4.6	L	2	4.6	23	< 0.02	< 0.005	< 3	n/a	n/a	23	1.2	2.0	
	2.0-2.25		5.9	L	5.2	L	1											
2.25-2.5	5.9	L	5.4	L	1													
BH03	0.0-0.25		7.1	L	4.5	M	3	6.1	3.4	< 0.02	< 0.005	< 3	n/a	n/a	3.4	0.2	0.3	
	0.25-0.5		5.2	L	4.1	L	2											
	0.5-0.75		5.3	L	4.2	L	2											
	0.75-1.0		5.2	L	4.2	L	1											
	1.0-1.25		5.4	L	4.6	L	2	4.6	22	< 0.02	< 0.005	< 3	n/a	n/a	22	1.1	1.9	
	1.25-1.5		5.4	L	4.6	L	1											
	1.5-1.75		5.6	L	4.8	L	1											
	1.75-2.0		5.6	L	4.8	L	2											
	2.0-2.25		5.5	L	4.8	L	1											
	2.25-2.5		5.5	L	5.1	L	1											
TP305	0.0-0.25		4.9	M	3.8	M	1	5.1	29	< 0.02	< 0.005	< 3	n/a	n/a	29	1.5	2.5	
	0.25-0.5		4.7	M	3.2	M	1											
	0.5-0.75		4.8	M	3.6	M	1	4.9	33	< 0.02	< 0.005	< 3	n/a	n/a	33	1.7	2.8	
	0.75-1.0		4.4	M	3.2	M	1											
	1.0-1.25		4.4	M	3.4	M	1											
	1.25-1.5		4.6	M	3.3	M	1	5.0	24	< 0.02	< 0.005	< 3	n/a	n/a	24	1.2	2.0	
	1.5-1.75		4.4	M	3.2	M	1											
	1.75-2.0		4.4	M	3.5	M	1											
TP306	0.0-0.25		5.4	L	3.6	M	3											
	0.25-0.5		4.9	M	3.0	M	1	5.3	15	< 0.02	< 0.005	< 3	n/a	n/a	15	0.8	1.3	
	0.5-0.75		4.5	M	3.1	M	1											
	0.75-1.0		4.7	M	3.5	M	1	4.6	45	< 0.02	< 0.005	< 3	n/a	n/a	45	2.3	3.8	
	1.0-1.25		4.5	M	3.4	M	1											
	1.25-1.5		4.6	M	3.5	M	1	4.5	41	< 0.02	< 0.005	< 3	n/a	n/a	41	2.1	3.5	
	1.5-1.75		4.4	M	3.4	M	1											
	1.75-2.0		4.3	M	3.6	M	1											
TP307	0.0-0.25		4.9	M	3.6	M	1	4.3	110	< 0.02	< 0.005	< 3	< 10	n/a	110	5.5	9.4	
	0.25-0.5		4.5	M	2.5	H	1											
	0.5-0.75		4.6	M	2.8	M	1											
	0.75-1.0		4.4	M	3.2	M	1											
	1.0-1.25		4.7	M	3.2	M	1	4.7	40	< 0.02	< 0.005	< 3	n/a	n/a	40	2.0	3.4	
	1.25-1.5		4.2	M	2.9	M	1											
	1.5-1.75		4.9	M	3.3	M	1											
	1.75-2.0		5.2	L	4.4	L	1	5.1	21	< 0.02	< 0.005	< 3	n/a	n/a	21	1.1	1.8	

Location & Depth (m)		Soil Type	pH _F	AASS likelihood ¹	pH _{FOX}	PASS likelihood ²	Reaction	pH KCl	Titratable Actual Acidity	S _{KCl}	Chromium Reducible Sulfur		S _{NAS}	ANC _{bt}	Net Acidity (Existing + Potential)	Indicative Lime Rate		
			pH Unit		pH Unit		1 to 4	pH Unit			mole H+ / t	%S				%S	mole H+ / t	mole H+ / t
TP308	0.0-0.25		5.0	L	2.7	H	3	4.2	120	< 0.02	< 0.005	< 3	< 10	n/a	120	6.0	10.2	
	0.25-0.5		4.6	M	3.5	M	1											
	0.5-0.75		5.1	L	3.1	M	1											
	0.75-1.0		4.5	M	3.5	M	1											
	1.0-1.25		4.5	M	3.8	M	1	4.4	68	0.02	< 0.005	< 3	< 10	n/a	68	3.4	5.8	
	1.25-1.5		4.7	M	3.7	M	1											
	1.5-1.75		4.6	M	3.7	M	1											
	1.75-2.0		4.8	M	4.0	L	1	4.8	24	< 0.02	< 0.005	< 3	n/a	n/a	24	1.2	2.0	
TP309	0.0-0.25		5.1	L	2.6	H	3	4.4	120	< 0.02	0.008	5	< 10	n/a	120	6.0	10.2	
	0.25-0.5		4.6	M	2.1	H	1											
	0.5-0.75		5.3	L	2.9	H	1	4.5	62	< 0.02	< 0.005	< 3	< 10	n/a	62	3.1	5.3	
	0.75-1.0		4.3	M	3.4	M	1											
	1.0-1.25		4.6	M	3.5	M	1											
	1.25-1.5		4.3	M	3.0	M	1											
	1.5-1.75		4.0	M	3.7	M	1											
	1.75-2.0		4.1	M	4.4	L	1	4.7	35	< 0.02	< 0.005	< 3	n/a	n/a	35	1.8	3.0	
BH04	0.0-0.25		6.6	L	3.8	M	3											
	0.25-0.5		3.9	H	2.9	M	2	3.9	37	0.04	< 0.005	< 3	79	n/a	116	8.7	14.8	
	0.5-0.75		3.8	H	2.9	M	2											
	0.75-1.0		3.9	H	2.9	M	2											
	1.0-1.25		4.0	M	2.8	M	2											
	1.25-1.5		4.2	M	2.7	M	2	4.2	110	< 0.02	< 0.005	< 3	32	n/a	142	10.7	18.1	
	1.5-1.75		4.0	M	2.9	M	2											
	1.75-2.0		4.2	M	3.2	M	2											
BH05	0.0-0.25		5.6	L	3.2	M	4											
	0.25-0.5		5.9	L	3.9	M	2	4.4	60	< 0.02	0.006	3.6	17	n/a	80.6	6.0	10.3	
	0.5-0.75		5.9	L	5.1	L	1											
	0.75-1.0		6.2	L	5.1	L	1	4.5	33	< 0.02	< 0.005	< 3	n/a	n/a	33	2.5	4.2	
	1.0-1.25		5.8	L	4.9	L	1											
TP301	0.0-0.25		5.3	L	3.2	M	3	4.3	150	< 0.02	< 0.005	< 3	10	n/a	160	12.0	20.4	
	0.25-0.5		4.0	M	3.0	M	2											
	0.5-0.75		3.9	H	2.9	M	1											
	0.75-1.0		3.9	H	3.0	M	1	4.0	190	0.06	< 0.005	< 3	< 10	n/a	190	14.3	24.2	
	1.0-1.25		3.8	H	2.7	M	2											
	1.25-1.5		3.8	H	2.7	M	1											
	1.5-1.75		4.2	M	2.6	M	1	4.0	180	0.05	< 0.005	< 3	< 10	n/a	180	13.5	23.0	
	1.75-2.0		3.8	H	2.5	M	1											
TP315	0.0-0.25		4.5	M	3.5	M	1	4.2	150	< 0.02	< 0.005	< 3	< 10	n/a	150	11.3	19.1	
	0.25-0.5		5.0	L	3.4	M	1											
	0.5-0.75		4.4	M	3.0	M	1											
	0.75-1.0		4.7	M	3.2	M	1	4.2	200	0.02	< 0.005	< 3	< 10	n/a	200	15.0	25.5	
	1.0-1.25		4.7	M	3.1	M	1											
	1.25-1.5		4.7	M	3.2	M	1											
	1.5-1.75		5.1	L	3.5	M	3	3.9	120	< 0.02	< 0.005	< 3	< 10	n/a	120	9.0	15.3	
	1.75-2.0		4.5	M	2.9	M	1											
TP316	0.0-0.25		5.6	L	3.6	M	3											
	0.25-0.5		5.1	L	3.9	M	1	4.6	44	< 0.02	< 0.005	< 3	n/a	n/a	44	3.3	5.6	
	0.5-0.75		5.0	L	3.8	M	1											
	0.75-1.0		5.1	L	3.4	M	1											
	1.0-1.25		5.7	L	4.3	L	1	4.6	48	< 0.02	< 0.005	< 3	n/a	n/a	48	3.6	6.1	
	1.25-1.5		5.4	L	3.8	M	1											
	1.5-1.75		5.0	L	4.1	L	1											
	1.75-2.0		5.3	L	4.4	L	1	4.5	64	< 0.02	< 0.005	< 3	< 10	n/a	64	4.8	8.2	

Location & Depth (m)		Soil Type	pH _F	AASS likelihood ¹	pH _{FOX}	PASS likelihood ²	Reaction	pH KCl	Titratable Actual Acidity	S _{KCl}	Chromium Reducible Sulfur		S _{NAS}	ANC _{bt}	Net Acidity (Existing + Potential)	Indicative Lime Rate	
			pH Unit		pH Unit		1 to 4	pH Unit			mole H+ / t	%S				%S	mole H+ / t
TP318	0.0-0.25		5.3	L	3.1	M	2										
	0.25-0.5		5.5	L	3.5	M	1	5.9	4	< 0.02	< 0.005	< 3	n/a	n/a	4	0.3	0.5
	0.5-0.75		5.2	L	3.6	M	1										
	0.75-1.0		5.9	L	3.6	M	1										
	1.0-1.25		5.0	L	3.7	M	1	4.9	25	< 0.02	< 0.005	< 3	n/a	n/a	25	1.9	3.2
	1.25-1.5		4.7	M	3.5	M	2										
	1.5-1.75		4.8	M	3.5	M	1										
	1.75-2.0		5.5	L	4.0	L	1	4.5	51	< 0.02	< 0.005	< 3	n/a	n/a	51	3.8	6.5
TP319	0.0-0.25		5.4	L	2.8	M	2	5.4	10	< 0.02	< 0.005	< 3	n/a	n/a	10	0.8	1.3
	0.25-0.5		5.2	L	3.9	M	1										
	0.5-0.75		5.1	L	3.3	M	2	4.8	23	< 0.02	< 0.005	< 3	n/a	n/a	23	1.7	2.9
	0.75-1.0		5.4	L	4.0	L	1										
	1.0-1.25		4.9	M	3.9	M	1										
	1.25-1.5		4.9	M	4.1	L	1										
	1.5-1.75		4.8	M	4.1	L	1	4.2	73	< 0.02	< 0.005	< 3	< 10	n/a	73	5.5	9.3
	1.75-2.0		5.1	L	4.2	L	1										
BH06	0.0-0.25		5.5	L	2.9	H	4										
	0.25-0.5		5.1	L	3.8	M	3										
	0.5-0.75		5.2	L	3.6	M	2	4.4	57	< 0.02	< 0.005	< 3	13	n/a	70	5.3	8.9
	0.75-1.0		4.9	M	3.5	M	1										
	1.0-1.25		4.5	M	3.7	M	2										
	1.25-1.5		4.5	M	3.8	M	1										
	1.5-1.75		5.0	L	3.7	M	1										
	1.75-2.0		5.2	L	4.0	L	1	4.3	46	0.03	< 0.005	< 3	21	n/a	67	5.0	8.5
BH07	0.0-0.25		5.4	L	3.3	M	4	4.3	110	< 0.02	0.013	8.3	22	n/a	140.3	10.5	17.9
	0.25-0.5		4.9	M	3.7	M	2										
	0.5-0.75		4.9	M	3.5	M	2										
	0.75-1.0		4.8	M	3.3	M	2										
	1.0-1.25		4.8	M	3.0	M	1										
	1.25-1.5		4.8	M	3.2	M	1	4.5	50	< 0.02	< 0.005	< 3	< 10	n/a	50	3.8	6.4
	1.5-1.75		4.9	M	3.0	M	1										
	1.75-2.0		4.6	M	3.1	M	2										
TP334	0.0-0.25		4.9	M	3.2	M	1										
	0.25-0.5		4.7	M	3.3	M	1	4.2	100	0.02	< 0.005	< 3	< 10	n/a	100	7.5	12.8
	0.5-0.75		4.5	M	3.1	M	1										
	0.75-1.0		4.3	M	2.8	M	1	4.3	99	0.04	< 0.005	< 3	< 10	n/a	99	7.4	12.6
	1.0-1.25		4.4	M	2.8	M	1										
	1.25-1.5		5.1	L	3.2	M	1	5.4	9	< 0.02	< 0.005	< 3	n/a	n/a	9	0.7	1.1
	1.5-1.75		5.2	L	3.0	M	1										
	1.75-2.0		5.3	L	3.3	M	1										
TP336	0.0-0.25		4.4	M	2.3	H	3	4.2	170	0.02	0.068	42	< 10	n/a	212	15.9	27.0
	0.25-0.5		4.2	M	2.8	M	1										
	0.5-0.75		4.0	M	2.6	M	1										
	0.75-1.0		4.2	M	2.7	M	1										
	1.0-1.25		4.5	M	2.9	M	1										
	1.25-1.5		4.5	M	2.6	M	1	4.6	26	< 0.02	< 0.005	< 3	n/a	n/a	26	2.0	3.3
	1.5-1.75		4.4	M	2.3	H	2										
	1.75-2.0		4.4	M	2.6	M	1	4.4	48	0.03	0.007	4	< 10	n/a	52	3.9	6.6

Location & Depth (m)		Soil Type	pH _F	AASS likelihood ¹	pH _{FOX}	PASS likelihood ²	Reaction	pH KCl	Titratable Actual Acidity	S _{KCl}	Chromium Reducible Sulfur		S _{NAS}	ANC _{bt}	Net Acidity (Existing + Potential)	Indicative Lime Rate	
			pH Unit		pH Unit		1 to 4	pH Unit			%S	mole H+ / t				mole H+ / t	mole H+ / t
BH08	0.0-0.25		5.8	L	3.2	M	4										
	0.25-0.5		5.6	L	3.4	M	3	4.3	73	< 0.02	< 0.005	< 3	< 10	n/a	77.7	5.8	9.9
	0.5-0.75		4.9	M	3.5	M	3										
	0.75-1.0		5.0	L	3.7	M	3										
	1.0-1.25		4.8	M	3.6	M	2	4.9	12	< 0.02	< 0.005	< 3	n/a	n/a	12	0.9	1.5
	1.25-1.5		4.8	M	3.9	M	1										
	1.5-1.75		4.8	M	3.8	M	1										
	1.75-2.0		4.8	M	3.8	M	1										
BH09	0.0-0.25		4.6	M	3.1	M	3	4.3	87	< 0.02	< 0.005	< 3	16	n/a	103	7.7	13.1
	0.25-0.5		4.6	M	3.3	M	2										
	0.5-0.75		4.4	M	3.4	M	3										
	0.75-1.0		4.4	M	3.4	M	2										
	1.0-1.25		4.5	M	3.3	M	2										
	1.25-1.5		4.8	M	3.7	M	2										
	1.5-1.75		4.7	M	3.6	M	2										
	1.75-2.0		4.7	M	3.7	M	2	4.5	32	0.05	< 0.005	< 3	18	n/a	50	3.8	6.4
BH10	0.0-0.25		5.7	L	3.2	M	4										
	0.25-0.5		5.2	L	3.4	M	4	4.4	57	< 0.02	< 0.005	< 3	19	n/a	76	5.7	9.7
	0.5-0.75		5.1	L	3.8	M	2										
	0.75-1.0		4.8	M	3.6	M	1										
	1.0-1.25		4.7	M	3.9	M	1	4.9	20	0.04	< 0.005	< 3	n/a	n/a	20	1.5	2.6
	1.25-1.5		4.9	M	3.9	M	1										
	1.5-1.75		5.0	L	4.4	L	1										
	1.75-2.0		5.0	L	4.6	L	1										
BH11	0.0-0.25		5.1	L	3.3	M	4	4.6	58	0.03	0.006	3.7	n/a	n/a	61.7	4.6	7.9
	0.25-0.5		4.5	M	2.8	M	4										
	0.5-0.75		4.1	M	3.2	M	4										
	0.75-1.0		4.0	M	3.3	M	2										
	1.0-1.25		3.9	H	3.0	M	2										
	1.25-1.5		3.9	H	3.0	M	2										
	1.5-1.75		4.0	M	2.9	M	2	4.1	110	0.07	0.005	3.2	28	n/a	141.2	10.6	18.0
	1.75-2.0		4.1	M	2.7	M	4										
	2.0-2.25		4.4	M	2.9	M	2										
	2.25-2.5		4.3	M	2.8	M	2										
	2.5-2.75		4.5	M	3.4	M	4										
	2.75-3.0		4.7	M	3.5	M	2	4.3	41	0.04	< 0.005	< 3	14	n/a	55	4.1	7.0
BH12	0.0-0.25		4.4	M	3.3	M	4										
	0.25-0.5		5.7	L	4.2	L	2										
	0.5-0.75		5.3	L	3.5	M	3	4.6	27	0.03	0.005	3.3	n/a	n/a	30.3	2.3	3.9
	0.75-1.0		4.9	M	3.8	M	2										
	1.0-1.25		4.8	M	4.0	L	1										
	1.25-1.5		4.9	M	4.1	L	1										
	1.5-1.75		4.9	M	4.3	L	1										
1.75-2.0		5.0	L	4.4	L	1	4.5	27	0.04	< 0.005	< 3	21	n/a	48	3.6	6.1	

Location & Depth (m)		Soil Type	pH _F	AASS likelihood ¹	pH _{FOX}	PASS likelihood ²	Reaction	pH KCl	Titratable Actual Acidity	S _{KCl}	Chromium Reducible Sulfur		S _{NAS}	ANC _{bt}	Net Acidity (Existing + Potential)	Indicative Lime Rate		
			pH Unit		pH Unit		1 to 4	pH Unit			%S	mole H+ / t				mole H+ / t	mole H+ / t	mole H+ / t
BH38	0.0-0.25		5.8	L	3.2	M	3											
	0.25-0.5		5.7	L	4.0	L	3	4.5	46	< 0.02	< 0.005	< 3	n/a	n/a	46	3.5	5.9	
	0.5-0.75		4.9	M	4.1	L	2											
	0.75-1.0		4.8	M	3.9	M	2											
	1.0-1.25		4.6	M	3.7	M	2											
	1.25-1.5		4.6	M	3.7	M	2	4.4	47	0.05	< 0.005	< 3	27	n/a	74	5.6	9.4	
	1.5-1.75		4.8	M	3.9	M	2											
	1.75-2.0		4.7	M	4.0	L	2											
	2.0-2.25		4.7	M	4.3	L	2											
	2.25-2.5		5.0	L	4.6	L	2											
	2.5-2.75		5.0	L	4.3	L	2	4.6	28	< 0.02	< 0.005	< 3	n/a	n/a	28	2.1	3.6	
	2.75-3.0		5.1	L	4.7	L	4											
BH39	0.0-0.25		6.4	L	3.2	M	4											
	0.25-0.5		6.3	L	4.1	M	4	4.6	43	< 0.02	< 0.005	< 3	n/a	n/a	43	3.2	5.5	
	0.5-0.75		5.7	L	4.4	L	4											
	0.75-1.0		5.6	L	4.3	L	2											
	1.0-1.25		5.3	L	4.6	L	4											
	1.25-1.5		5.0	L	4.6	L	4	4.2	49	0.07	< 0.005	< 3	38	n/a	87	6.5	11.1	
	1.5-1.75		5.1	L	4.5	L	4											
	1.75-2.0		5.0	L	4.4	L	4											
	2.0-2.25		5.2	L	4.7	L	4	4.5	17	0.03	< 0.005	< 3	n/a	n/a	17	1.3	2.2	
	2.25-2.5		5.5	L	4.4	L	1											
	2.5-2.75		5.5	L	4.3	L	1											
	2.75-3.0		5.3	L	4.3	L	1											
BH40	0.0-0.25		6.2	L	3.2	M	3											
	0.25-0.5		6.8	L	4.3	M	1	5.3	7.7	< 0.02	< 0.005	< 3	n/a	n/a	7.7	0.4	0.7	
	0.5-0.75		7.5	L	5.7	L	1											
	0.75-1.0		7.7	L	6.0	L	4											
	1.0-1.25		8.2	L	7.8	L	4											
	1.25-1.5		8.0	L	6.4	L	4	6.3	< 2	< 0.02	< 0.005	< 3	n/a	n/a	0	0.0	0.0	
	1.5-1.75		8.4	L	8.8	L	4											
	1.75-2.0		8.2	L	7.7	L	4											
	2.0-2.25		7.9	L	8.4	L	4											
	2.25-2.5		9.1	L	9.4	L	4	8.7	< 2	< 0.02	< 0.005	< 3	n/a	990	0	0.0	0.0	
	2.5-2.75		8.8	L	9.4	L	4											
	2.75-3.0		8.9	L	9.5	L	4											
BH41	0.0-0.25		6.1	L	3.2	M	4	4.6	38	< 0.02	< 0.005	< 3	n/a	n/a	38	1.9	3.2	
	0.25-0.5		6.5	L	4.0	M	4											
	0.5-0.75		7.1	L	5.2	L	4											
	0.75-1.0		7.5	L	5.8	L	4											
	1.0-1.25		7.5	L	6.2	L	4	6.0	6.1	< 0.02	< 0.005	< 3	n/a	n/a	6.1	0.3	0.5	
	1.25-1.5		8.1	L	7.6	L	4											
	1.5-1.75		8.3	L	8.0	L	4											
	1.75-2.0		7.8	L	6.3	L	4											
	2.0-2.25		8.6	L	7.4	L	4											
	2.25-2.5		-	-	-	-	-	6.2	4	< 0.02	< 0.005	< 3	n/a	n/a	4	0.2	0.3	
	2.5-2.75		8.5	L	7.1	L	4											
	2.75-3.0		8.5	L	7.1	L	1											
3.0-3.25		8.2	L	7.0	L	4												
3.25-3.5		8.3	L	6.8	L	4	6.1	4.1	< 0.02	< 0.005	< 3	n/a	n/a	4.1	0.2	0.3		

Location & Depth (m)		Soil Type	pH _F	AASS likelihood ¹	pH _{FOX}	PASS likelihood ²	Reaction	pH KCl	Titratable Actual Acidity	S _{KCl}	Chromium Reducible Sulfur		S _{NAS}	ANC _{bt}	Net Acidity (Existing + Potential)	Indicative Lime Rate	
			pH Unit		pH Unit		1 to 4	pH Unit			mole H+ / t	%S				%S	mole H+ / t
BH45	0.0-0.25		5.5	L	3.4	M	4										
	0.25-0.5		5.9	L	3.4	M	4	4.9	20	< 0.02	< 0.005	< 3	n/a	n/a	20	1.0	1.7
	0.5-0.75		6.4	L	3.8	M	4										
	0.75-1.0		6.6	L	4.6	M	4										
	1.0-1.25		6.6	L	5.2	L	3										
	1.25-1.5		7.1	L	6.7	L	2	5.8	8.1	< 0.02	< 0.005	< 3	n/a	n/a	8.1	0.4	0.7
	1.5-1.75		7.5	L	8.2	L	4										
	1.75-2.0		7.9	L	8.3	L	4										
	2.0-2.25		7.5	L	8.0	L	4										
	2.25-2.5		8.1	L	7.3	L	2										
	2.5-2.75		8.3	L	7.3	L	2										
	2.75-3.0		8.3	L	8.2	L	4										
	3.0-3.25		8.5	L	7.3	L	2	6.7	< 2	< 0.02	< 0.005	< 3	n/a	73	0	0.0	0.0
	3.25-3.5		8.6	L	7.2	L	2										
BH46	0.0-0.25		6.6	L	3.8	M	2										
	0.25-0.5		6.4	L	4.1	M	4	5.2	14	< 0.02	< 0.005	< 3	n/a	n/a	14	0.7	1.2
	0.5-0.75		6.6	L	4.5	M	2										
	0.75-1.0		6.7	L	4.9	L	2										
	1.0-1.25		7.4	L	6.1	L	4										
	1.25-1.5		7.4	L	7.7	L	4										
	1.5-1.75		7.6	L	7.8	L	4	5.9	6.8	< 0.02	< 0.005	< 3	n/a	n/a	6.8	0.3	0.6
	1.75-2.0		7.9	L	7.9	L	2										
	2.0-2.25		8.0	L	7.0	L	4										
	2.25-2.5		8.2	L	7.7	L	4										
	2.5-2.75		8.0	L	7.8	L	4										
	2.75-3.0		8.6	L	6.8	L	2	6.2	4	< 0.02	< 0.005	< 3	n/a	n/a	4	0.2	0.3
	3.0-3.25		8.7	L	8.4	L	2										
	3.25-3.5		8.8	L	8.4	L	4										
BH47	0.0-0.25		6.4	L	3.6	M	4	5.3	17	< 0.02	< 0.005	< 3	n/a	n/a	17	0.9	1.4
	0.25-0.5		6.9	L	5.7	L	2										
	0.5-0.75		7.2	L	5.7	L	4										
	0.75-1.0		7.4	L	5.8	L	4										
	1.0-1.25		7.7	L	7.4	L	4	6.1	6.1	< 0.02	< 0.005	< 3	n/a	n/a	6.1	0.3	0.5
	1.25-1.5		8.1	L	7.9	L	1										
	1.5-1.75		8.1	L	8.3	L	4										
	1.75-2.0		8.1	L	8.4	L	4										
	2.0-2.25		8.1	L	8.2	L	4	6.0	6.9	< 0.02	< 0.005	< 3	n/a	n/a	6.9	0.3	0.6
	2.25-2.5		7.9	L	8.3	L	4										
	2.5-2.75		7.7	L	8.1	L	4										
	2.75-3.0		7.8	L	8.2	L	4										
	3.0-3.25		7.6	L	8.2	L	4										
	3.25-3.5		7.8	L	8.1	L	4	5.8	6.9	< 0.02	< 0.005	< 3	n/a	n/a	6.9	0.3	0.6

Location & Depth (m)		Soil Type	pH _F	AASS likelihood ¹	pH _{FOX}	PASS likelihood ²	Reaction	pH KCl	Titratable Actual Acidity	S _{KCl}	Chromium Reducible Sulfur		S _{NAS}	ANC _{bt}	Net Acidity (Existing + Potential)	Indicative Lime Rate	
			pH Unit		pH Unit			1 to 4			pH Unit	mole H+ / t				%S	%S
BH83	0.0-0.25		5.7	L	2.6	H	3										
	0.25-0.5		5.9	L	3.8	M	3	4.1	98	< 0.02	< 0.005	< 3	< 10	n/a	98	4.9	8.3
	0.5-0.75		5.0	L	4.1	L	2										
	0.75-1.0		4.9	M	4.2	L	2										
	1.0-1.25		4.8	M	4.3	L	1										
	1.25-1.5		5.2	L	4.2	L	4	4.1	88	< 0.02	< 0.005	< 3	23	n/a	111	5.6	9.4
	1.5-1.75		5.1	L	4.6	L	1										
	1.75-2.0		5.0	L	4.5	L	1										
BH84	0.0-0.25		6.0	L	3.1	M	4	4.5	46	< 0.02	< 0.005	< 3	< 10	n/a	46	2.3	3.9
	0.25-0.5		5.4	L	4.5	L	2										
	0.5-0.75		5.1	L	4.1	L	2										
	0.75-1.0		5.0	L	3.9	M	4	4.0	77	0.02	< 0.005	< 3	21	n/a	98	4.9	8.3
	1.0-1.25		4.8	M	4.4	L	1										
	1.25-1.5		4.7	M	4.3	L	1										
	1.5-1.75		4.9	M	4.7	L	1										
	1.75-2.0		4.8	M	4.2	L	1										
BH85	0.0-0.25		5.6	L	2.8	H	3										
	0.25-0.5		5.7	L	3.7	M	4										
	0.5-0.75		5.1	L	4.1	L	2	4.4	50	0.04	< 0.005	< 3	35	n/a	85	4.3	7.2
	0.75-1.0		5.2	L	4.2	L	1										
	1.0-1.25		5.3	L	4.5	L	1										
	1.25-1.5		5.5	L	4.5	L	4	4.6	23	0.03	< 0.005	< 3	n/a	n/a	23	1.2	2.0
	1.5-1.75		6.5	L	4.8	L	1										
	1.75-2.0		5.6	L	5.6	L	1										

Notes:

1. Actual Acid Sulfate Soil (AASS) likelihood is indicated by Low (L & no shading)(pH_F > 5). Medium (M & yellow shade)(pH_F 5 ≤ pH_F < 4) and High (H & red shade)(pH_F ≤ 4).
2. Potential Acid Sulfate Soil (PASS) likelihood is indicated by Low (L & no shading, where pH_{FOX} is > 4 and Δ pH from pH_F to pH_{FOX} is < 2 pH units). Medium (M & yellow shade, where Δ pH from pH_F to pH_{FOX} is ≥ 2 pH units OR pH_{FOX} is < 4) and High (H and red shade)(change from pH_F to pH_{FOX} is ≥ 2 pH units AND pH_{FOX} is < 3)
3. Reaction 1 = Nil to slight reaction, 2 = Moderate reaction, 3 = Strong reaction (persistent froth), 4 = Extreme reaction.
4. Shaded TAA & SCR results are those exceeding the QASSIT action levels of 18 mol H⁺/t or 0.03 %S (SKCl < 0.03%S Yellow; SKCl > 0.3%S Red; ANC > 0.03%S Green).
5. Required Lime Rate is calculated from the net Acid-Base Account (utilising 50% of existing ANC), with a factor of safety = 1.5 for ASS material and bulk density of 1.7 t/m³. N/R = Not Required

Tectonic Geotechnical Pty Ltd
 40A Glen Vista Place
 Chevalum
 Qld 4555



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 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: **Mark Thomson**

Report **677330-S**
 Project name **MIBA - NORTH HARBOUR**
 Project ID **19210**
 Received Date **Sep 16, 2019**

Client Sample ID			BH001 - 0.0-0.25M	BH001 - 0.25-0.5M	BH001 - 0.5-0.75M	BH001 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24833	B19-Se24834	B19-Se24835	B19-Se24836
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.9	7.6	6.1	6.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.7	5.6	4.9	5.3
Reaction Ratings* ^{S05}		comment	3.0	1.0	1.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	5.5	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	9.0	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.010	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	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	-	< 0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	< 1	-	-
<2mm Fraction	0.005	g	-	120	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	12	-	-

Client Sample ID			BH001 - 1.00-1.25M	BH001 - 1.25-1.5M	BH001 - 1.5-1.75M	BH002 - 0.0-0.25M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24837	B19-Se24838	B19-Se24839	B19-Se24840
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.2	6.8	6.9	6.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.5	6.0	6.1	3.4
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	5.6	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	6.1	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.010	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	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	-	< 0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	< 1	-	-
<2mm Fraction	0.005	g	-	48	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	8.8	-	-

Client Sample ID			BH002 - 0.25-0.5M	BH002 - 0.5-0.75M	BH002 - 0.75-1.00M	BH002 - 1.00-1.25M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24841	B19-Se24842	B19-Se24843	B19-Se24844
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.3	5.5	5.5	5.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.4	4.5	4.1	4.6
Reaction Ratings* ^{S05}		comment	3.0	2.0	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.4	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	35	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-

Client Sample ID			BH002 - 0.25-0.5M	BH002 - 0.5-0.75M	BH002 - 0.75-1.00M	BH002 - 1.00-1.25M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24841	B19-Se24842	B19-Se24843	B19-Se24844
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	< 0.02	-	-
Net Acid soluble sulfur	0.02	% S	-	< 0.02	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	< 10	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	< 0.02	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	35	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	2.6	-	-
<2mm Fraction	0.005	g	-	69	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	19	-	-

Client Sample ID			BH002 - 1.25-1.5M	BH002 - 1.5-1.75M	BH002 - 1.75-2.0M	BH002 - 2.0-2.25M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24845	B19-Se24846	B19-Se24847	B19-Se24848
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.8	5.9	5.7	5.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.0	4.6	4.6	5.2
Reaction Ratings ^{S05}		comment	2.0	2.0	2.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	4.6	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	23	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.040	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	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	-	-	0.04	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	23	-

Client Sample ID			BH002 - 1.25-1.5M	BH002 - 1.5-1.75M	BH002 - 1.75-2.0M	BH002 - 2.0-2.25M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24845	B19-Se24846	B19-Se24847	B19-Se24848
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	1.7	-
<2mm Fraction	0.005	g	-	-	86	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture						
	1	%	-	-	14	-

Client Sample ID			BH002 - 2.25-2.5M	BH003 - 0.0-0.25M	BH003 - 0.25-0.5M	BH003 - 0.5-0.75M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24849	B19-Se24850	B19-Se24851	B19-Se24852
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.9	7.1	5.2	5.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.4	4.5	4.1	4.2
Reaction Ratings* ^{S05}		comment	1.0	3.0	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	6.1	-	-
Acid trail - Titratable Actual Acidity	2	mol H ⁺ /t	-	3.4	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.010	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H ⁺ /t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	< 0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H ⁺ /t	-	< 10	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	< 1	-	-
<2mm Fraction	0.005	g	-	92	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	1	%	-	4.5	-	-

Client Sample ID			BH003 - 0.75-1.00M	BH003 - 1.00-1.25M	BH003 - 1.25-1.5M	BH003 - 1.5-1.75M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24853	B19-Se24854	B19-Se24855	B19-Se24856
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.2	5.4	5.4	5.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.2	4.6	4.6	4.8
Reaction Ratings**S05		comment	1.0	2.0	1.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.6	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	22	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.030	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	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	-	0.03	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	22	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	1.6	-	-
<2mm Fraction	0.005	g	-	130	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	14	-	-

Client Sample ID			BH003 - 1.75-2.0M	BH003 - 2.00-2.25M	BH003 - 2.25-2.5M	BH004 - 0.00-0.25M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24857	B19-Se24858	B19-Se24859	B19-Se24860
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.6	5.5	5.5	6.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.8	4.8	5.1	3.8
Reaction Ratings**S05		comment	2.0	1.0	1.0	3.0

Client Sample ID			BH004 - 0.25-0.5M	BH004 - 0.5-0.75M	BH004 - 0.75-1.00M	BH004 - 1.00-1.25M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24861	B19-Se24862	B19-Se24863	B19-Se24864
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	3.9	3.8	3.9	4.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.9	2.9	2.9	2.8
Reaction Ratings**S05		comment	2.0	2.0	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	3.9	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	37	-	-	-
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	0.04	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-
HCl Extractable Sulfur	0.02	% S	0.21	-	-	-
Net Acid soluble sulfur	0.02	% S	0.17	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	79	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	0.13	-	-	-
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	0.18	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	120	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	8.7	-	-	-
<2mm Fraction	0.005	g	89	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture	1	%	32	-	-	-

Client Sample ID			BH004 - 1.25-1.5M	BH004 - 1.5-1.75M	BH004 - 1.75-2.0M	BH005 - 0.0-0.25M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24865	B19-Se24866	B19-Se24867	B19-Se24868
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.2	4.0	4.2	5.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.7	2.9	3.2	3.2
Reaction Ratings**S05		comment	2.0	2.0	2.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.2	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	110	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.17	-	-	-
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	< 0.02	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-

Client Sample ID			BH004 - 1.25-1.5M	BH004 - 1.5-1.75M	BH004 - 1.75-2.0M	BH005 - 0.0-0.25M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24865	B19-Se24866	B19-Se24867	B19-Se24868
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	0.07	-	-	-
Net Acid soluble sulfur	0.02	% S	0.07	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	32	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	0.05	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	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	0.22	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	140	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	10	-	-	-
<2mm Fraction	0.005	g	96	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture	1	%	26	-	-	-

Client Sample ID			BH005 - 0.25-0.5M	BH005 - 0.5-0.75M	BH005 - 0.75-1.00M	BH005 - 1.00-1.25M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24869	B19-Se24870	B19-Se24871	B19-Se24872
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.9	5.9	6.2	5.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.9	5.1	5.1	4.9
Reaction Ratings ^{S05}		comment	2.0	1.0	1.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.4	-	4.5	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	60	-	33	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.10	-	0.050	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	0.006	-	< 0.005	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	3.6	-	< 3	-
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	2.0	-
HCl Extractable Sulfur	0.02	% S	0.04	-	n/a	-
Net Acid soluble sulfur	0.02	% S	0.04	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	17	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	0.03	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	n/a	-	n/a	-
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	n/a	-	n/a	-
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	n/a	-
ANC Fineness Factor		factor	1.5	-	1.5	-
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	0.13	-	0.05	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	80	-	33	-

Client Sample ID			BH005 - 0.25-0.5M	BH005 - 0.5-0.75M	BH005 - 0.75-1.00M	BH005 - 1.00-1.25M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24869	B19-Se24870	B19-Se24871	B19-Se24872
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	6.0	-	2.5	-
<2mm Fraction	0.005	g	45	-	74	-
>2mm Fraction	0.005	g	23	-	< 0.005	-
Analysed Material	0.1	%	66	-	100	-
Extraneous Material	0.1	%	34	-	< 0.1	-
% Moisture						
	1	%	16	-	13	-

Client Sample ID			BH006 - 0.0-0.25	BH006 - 0.25-0.5M	BH006 - 0.5-0.75M	BH006 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24873	B19-Se24874	B19-Se24875	B19-Se24876
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.5	5.1	5.2	4.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.9	3.8	3.6	3.5
Reaction Ratings* ^{S05}		comment	4.0	3.0	2.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	4.4	-
Acid trail - Titratable Actual Acidity	2	mol H ⁺ /t	-	-	57	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.090	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	0.03	-
Net Acid soluble sulfur	0.02	% S	-	-	0.03	-
Net Acid soluble sulfur - acidity units	10	mol H ⁺ /t	-	-	13	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	0.02	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	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	-	-	0.11	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H ⁺ /t	-	-	69	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	5.2	-
<2mm Fraction	0.005	g	-	-	89	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture						
	1	%	-	-	17	-

Client Sample ID			BH006 - 1.00-1.25M	BH006 - 1.25-1.5M	BH006 - 1.5-1.75M	BH006 - 1.75-2.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24877	B19-Se24878	B19-Se24879	B19-Se24880
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.5	4.5	5.0	5.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.7	3.8	3.7	4.0
Reaction Ratings* ^{S05}		comment	2.0	1.0	1.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	4.3
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	46
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.070
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	-	-	-	0.03
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	0.07
Net Acid soluble sulfur	0.02	% S	-	-	-	0.04
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	21
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	0.03
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	-	-	-	0.11
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	67
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	5.0
<2mm Fraction	0.005	g	-	-	-	63
>2mm Fraction	0.005	g	-	-	-	35
Analysed Material	0.1	%	-	-	-	64
Extraneous Material	0.1	%	-	-	-	36
% Moisture	1	%	-	-	-	27

Client Sample ID			BH007 - 0.0-0.25M	BH007 - 0.25-0.5M	BH007 - 0.5-0.75M	BH007 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24881	B19-Se24882	B19-Se24883	B19-Se24884
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.4	4.9	4.9	4.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.3	3.7	3.5	3.3
Reaction Ratings* ^{S05}		comment	4.0	2.0	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.3	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	110	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.17	-	-	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	0.013	-	-	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	8.3	-	-	-
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-

Client Sample ID			BH007 - 0.0-0.25M	BH007 - 0.25-0.5M	BH007 - 0.5-0.75M	BH007 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24881	B19-Se24882	B19-Se24883	B19-Se24884
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	0.05	-	-	-
Net Acid soluble sulfur	0.02	% S	0.05	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	22	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	0.04	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	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	0.22	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	140	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	10	-	-	-
<2mm Fraction	0.005	g	62	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture	1	%	40	-	-	-

Client Sample ID			BH007 - 1.00-1.25M	BH007 - 1.25-1.5M	BH007 - 1.5-1.75M	BH007 - 1.75-2.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24885	B19-Se24886	B19-Se24887	B19-Se24888
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.8	4.8	4.9	4.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.0	3.2	3.0	3.1
Reaction Ratings ^{S05}		comment	1.0	1.0	1.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.5	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	50	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.080	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	< 0.02	-	-
Net Acid soluble sulfur	0.02	% S	-	< 0.02	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	< 10	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	< 0.02	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	0.08	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	50	-	-

Client Sample ID			BH007 - 1.00-1.25M	BH007 - 1.25-1.5M	BH007 - 1.5-1.75M	BH007 - 1.75-2.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24885	B19-Se24886	B19-Se24887	B19-Se24888
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	3.7	-	-
<2mm Fraction	0.005	g	-	60	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	1	%	-	11	-	-

Client Sample ID			BH0021 - 0.0-0.25M	BH0021 - 0.25-0.5M	BH0021 - 0.5-0.75M	BH0021 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24889	B19-Se24890	B19-Se24891	B19-Se24892
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.2	4.0	3.8	3.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.5	2.9	2.8	2.9
Reaction Ratings* ^{S05}		comment	3.0	2.0	2.0	3.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	4.0	-
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	-	-	0.07	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	0.15	-
Net Acid soluble sulfur	0.02	% S	-	-	0.09	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	41	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	0.07	-
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	-	-	0.12	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	77	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	5.8	-
<2mm Fraction	0.005	g	-	-	68	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture						
	1	%	-	-	23	-

Client Sample ID			BH0021 - 1.00-1.25M	BH0021 - 1.25-1.5M	BH0021 - 1.5-1.75M	BH0021 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24893	B19-Se24894	B19-Se24895	B19-Se24896
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.0	3.8	4.1	4.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.6	2.7	2.3	1.9
Reaction Ratings**S05		comment	2.0	2.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.1	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	180	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.29	-	-	-
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	0.03	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-
HCl Extractable Sulfur	0.02	% S	0.06	-	-	-
Net Acid soluble sulfur	0.02	% S	0.03	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	15	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	0.02	-	-	-
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	0.31	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	200	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	15	-	-	-
<2mm Fraction	0.005	g	57	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture	1	%	30	-	-	-

Client Sample ID			BH0021 - 2.00-2.25M	BH0021 - 2.25-2.5M	BH0021 - 2.5-2.75M	BH0021 - 2.75-3.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24897	B19-Se24898	B19-Se24899	B19-Se24900
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.5	4.6	6.0	7.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	1.8	1.8	2.0	5.5
Reaction Ratings**S05		comment	4.0	4.0	4.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.1	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	190	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.30	-	-	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	3.9	-	-	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	2400	-	-	-
Sulfur - KCl Extractable	0.02	% S	0.17	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-

Client Sample ID			BH0021 - 2.00-2.25M	BH0021 - 2.25-2.5M	BH0021 - 2.5-2.75M	BH0021 - 2.75-3.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24897	B19-Se24898	B19-Se24899	B19-Se24900
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	0.34	-	-	-
Net Acid soluble sulfur	0.02	% S	0.16	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	75	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	0.12	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	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	4.3	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	2700	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	200	-	-	-
<2mm Fraction	0.005	g	50	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture	1	%	45	-	-	-

Client Sample ID			BH0021 - 3.00-3.25M	BH0021 - 3.25-3.5M	BH0021 - 3.5-3.75M	BH0021 - 3.75-4.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24901	B19-Se24902	B19-Se24903	B19-Se24904
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.1	6.9	6.6	7.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.3	5.1	4.8	5.3
Reaction Ratings ^{S05}		comment	2.0	2.0	2.0	1.0

Client Sample ID			BH0022 - 0.0-0.25M	BH0022 - 0.25-0.5M	BH0022 - 0.5-0.75M	BH0022 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24905	B19-Se24906	B19-Se24907	B19-Se24908
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.2	5.1	5.3	5.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.0	3.2	3.1	3.2
Reaction Ratings ^{S05}		comment	4.0	2.0	1.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	5.0
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	14
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.020
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	-	-	0.046
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	-	-	28
Sulfur - KCl Extractable	0.02	% S	-	-	-	< 0.02

Client Sample ID			BH0022 - 0.0-0.25M	BH0022 - 0.25-0.5M	BH0022 - 0.5-0.75M	BH0022 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24905	B19-Se24906	B19-Se24907	B19-Se24908
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	-	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	-	-	-	0.07
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	43
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	-	3.2
<2mm Fraction	0.005	g	-	-	-	79
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture	1	%	-	-	-	19

Client Sample ID			BH0022 - 1.00-1.25M	BH0022 - 1.25-1.5M	BH0022 - 1.5-1.75M	BH0022 - 1.75-2.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24909	B19-Se24910	B19-Se24911	B19-Se24912
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.2	5.2	5.1	4.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.8	3.0	3.0	2.3
Reaction Ratings ^{S05}		comment	1.0	1.0	1.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	5.5
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	4.0
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.010
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	-	-	0.052
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	-	-	32
Sulfur - KCl Extractable	0.02	% S	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	-	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

Client Sample ID			BH0022 - 1.00-1.25M	BH0022 - 1.25-1.5M	BH0022 - 1.5-1.75M	BH0022 - 1.75-2.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se24909	B19-Se24910	B19-Se24911	B19-Se24912
Date Sampled			Sep 11, 2019	Sep 11, 2019	Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	36
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	2.7
<2mm Fraction	0.005	g	-	-	-	150
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture						
	1	%	-	-	-	12

Client Sample ID			BH0022 - 2.0-2.25M	BH0022 - 2.25-2.5M
Sample Matrix			Soil	Soil
Eurofins Sample No.			B19-Se24913	B19-Se24914
Date Sampled			Sep 11, 2019	Sep 11, 2019
Test/Reference	LOR	Unit		
Acid Sulfate Soils Field pH Test				
pH-F (Field pH test)*	0.1	pH Units	5.1	5.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.1	2.6
Reaction Ratings ^{S05}		comment	2.0	3.0

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

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 - Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests	Brisbane	Sep 17, 2019	7 Days
Chromium Suite (SKCI) - Method: LTM-GEN-7070	Brisbane	Sep 24, 2019	6 Week
% Moisture - Method: LTM-GEN-7080 Moisture	Brisbane	Sep 16, 2019	14 Days

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 16, 2019 9:00 AM
Address:	40A Glen Vista Place Chevalum Qld 4555	Report #:	677330	Due:	Sep 23, 2019
Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	5 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	BH001 - 0.0-0.25M	Sep 11, 2019		Soil	B19-Se24833	X		
2	BH001 - 0.25-0.5M	Sep 11, 2019		Soil	B19-Se24834	X	X	X
3	BH001 - 0.5-0.75M	Sep 11, 2019		Soil	B19-Se24835	X		
4	BH001 - 0.75-1.00M	Sep 11, 2019		Soil	B19-Se24836	X		
5	BH001 - 1.00-1.25M	Sep 11, 2019		Soil	B19-Se24837	X		
6	BH001 - 1.25-	Sep 11, 2019		Soil	B19-Se24838	X	X	X

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 16, 2019 9:00 AM
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Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	5 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
7	BH001 - 1.5-1.75M	Sep 11, 2019		Soil	B19-Se24839	X		
8	BH002 - 0.0-0.25M	Sep 11, 2019		Soil	B19-Se24840	X		
9	BH002 - 0.25-0.5M	Sep 11, 2019		Soil	B19-Se24841	X		
10	BH002 - 0.5-0.75M	Sep 11, 2019		Soil	B19-Se24842	X	X	X
11	BH002 - 0.75-1.00M	Sep 11, 2019		Soil	B19-Se24843	X		
12	BH002 - 1.00-1.25M	Sep 11, 2019		Soil	B19-Se24844	X		
13	BH002 - 1.25-	Sep 11, 2019		Soil	B19-Se24845	X		

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 16, 2019 9:00 AM
Address:	40A Glen Vista Place Chevalum Qld 4555	Report #:	677330	Due:	Sep 23, 2019
Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	5 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
14	BH002 - 1.5-1.75M	Sep 11, 2019		Soil	B19-Se24846	X		
15	BH002 - 1.75-2.0M	Sep 11, 2019		Soil	B19-Se24847	X	X	X
16	BH002 - 2.0-2.25M	Sep 11, 2019		Soil	B19-Se24848	X		
17	BH002 - 2.25-2.5M	Sep 11, 2019		Soil	B19-Se24849	X		
18	BH003 - 0.0-0.25M	Sep 11, 2019		Soil	B19-Se24850	X	X	X
19	BH003 - 0.25-0.5M	Sep 11, 2019		Soil	B19-Se24851	X		
20	BH003 - 0.5-	Sep 11, 2019		Soil	B19-Se24852	X		

Company Name: Tectonic Geotechnical Pty Ltd	Order No.:	Received: Sep 16, 2019 9:00 AM
Address: 40A Glen Vista Place Chevalum Qld 4555	Report #: 677330	Due: Sep 23, 2019
	Phone: 07 5478 9642	Priority: 5 Day
	Fax:	Contact Name: Mark Thomson
Project Name: MIBA - NORTH HARBOUR		
Project ID: 19210		

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	0.75M							
21	BH003 - 0.75-1.00M	Sep 11, 2019		Soil	B19-Se24853	X		
22	BH003 - 1.00-1.25M	Sep 11, 2019		Soil	B19-Se24854	X	X	X
23	BH003 - 1.25-1.5M	Sep 11, 2019		Soil	B19-Se24855	X		
24	BH003 - 1.5-1.75M	Sep 11, 2019		Soil	B19-Se24856	X		
25	BH003 - 1.75-2.0M	Sep 11, 2019		Soil	B19-Se24857	X		
26	BH003 - 2.00-2.25M	Sep 11, 2019		Soil	B19-Se24858	X		
27	BH003 - 2.25-	Sep 11, 2019		Soil	B19-Se24859	X		

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 16, 2019 9:00 AM
Address:	40A Glen Vista Place Chevalum Qld 4555	Report #:	677330	Due:	Sep 23, 2019
Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	5 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	2.5M							
28	BH004 - 0.00-0.25M	Sep 11, 2019		Soil	B19-Se24860	X		
29	BH004 - 0.25-0.5M	Sep 11, 2019		Soil	B19-Se24861	X	X	X
30	BH004 - 0.5-0.75M	Sep 11, 2019		Soil	B19-Se24862	X		
31	BH004 - 0.75-1.00M	Sep 11, 2019		Soil	B19-Se24863	X		
32	BH004 - 1.00-1.25M	Sep 11, 2019		Soil	B19-Se24864	X		
33	BH004 - 1.25-1.5M	Sep 11, 2019		Soil	B19-Se24865	X	X	X
34	BH004 - 1.5-	Sep 11, 2019		Soil	B19-Se24866	X		

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 16, 2019 9:00 AM
Address:	40A Glen Vista Place Chevalum Qld 4555	Report #:	677330	Due:	Sep 23, 2019
Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	5 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.75M							
35	BH004 - 1.75-2.0M	Sep 11, 2019		Soil	B19-Se24867	X		
36	BH005 - 0.0-0.25M	Sep 11, 2019		Soil	B19-Se24868	X		
37	BH005 - 0.25-0.5M	Sep 11, 2019		Soil	B19-Se24869	X	X	X
38	BH005 - 0.5-0.75M	Sep 11, 2019		Soil	B19-Se24870	X		
39	BH005 - 0.75-1.00M	Sep 11, 2019		Soil	B19-Se24871	X	X	X
40	BH005 - 1.00-1.25M	Sep 11, 2019		Soil	B19-Se24872	X		
41	BH006 - 0.0-	Sep 11, 2019		Soil	B19-Se24873	X		

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 16, 2019 9:00 AM
Address:	40A Glen Vista Place Chevalum Qld 4555	Report #:	677330	Due:	Sep 23, 2019
Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	5 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	0.25							
42	BH006 - 0.25-0.5M	Sep 11, 2019		Soil	B19-Se24874	X		
43	BH006 - 0.5-0.75M	Sep 11, 2019		Soil	B19-Se24875	X	X	
44	BH006 - 0.75-1.00M	Sep 11, 2019		Soil	B19-Se24876	X		
45	BH006 - 1.00-1.25M	Sep 11, 2019		Soil	B19-Se24877	X		
46	BH006 - 1.25-1.5M	Sep 11, 2019		Soil	B19-Se24878	X		
47	BH006 - 1.5-1.75M	Sep 11, 2019		Soil	B19-Se24879	X		
48	BH006 - 1.75-	Sep 11, 2019		Soil	B19-Se24880	X	X	

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 16, 2019 9:00 AM
Address:	40A Glen Vista Place Chevalum Qld 4555	Report #:	677330	Due:	Sep 23, 2019
Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	5 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson
Eurofins Analytical Services Manager : Ryan Gilbert					

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	2.00M							
49	BH007 - 0.0-0.25M	Sep 11, 2019		Soil	B19-Se24881	X	X	X
50	BH007 - 0.25-0.5M	Sep 11, 2019		Soil	B19-Se24882	X		
51	BH007 - 0.5-0.75M	Sep 11, 2019		Soil	B19-Se24883	X		
52	BH007 - 0.75-1.00M	Sep 11, 2019		Soil	B19-Se24884	X		
53	BH007 - 1.00-1.25M	Sep 11, 2019		Soil	B19-Se24885	X		
54	BH007 - 1.25-1.5M	Sep 11, 2019		Soil	B19-Se24886	X	X	X
55	BH007 - 1.5-	Sep 11, 2019		Soil	B19-Se24887	X		

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Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	5 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.75M							
56	BH007 - 1.75-2.00M	Sep 11, 2019		Soil	B19-Se24888	X		
57	BH0021 - 0.0-0.25M	Sep 11, 2019		Soil	B19-Se24889	X		
58	BH0021 - 0.25-0.5M	Sep 11, 2019		Soil	B19-Se24890	X		
59	BH0021 - 0.5-0.75M	Sep 11, 2019		Soil	B19-Se24891	X	X	X
60	BH0021 - 0.75-1.00M	Sep 11, 2019		Soil	B19-Se24892	X		
61	BH0021 - 1.00-1.25M	Sep 11, 2019		Soil	B19-Se24893	X	X	X
62	BH0021 -	Sep 11, 2019		Soil	B19-Se24894	X		

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 16, 2019 9:00 AM
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Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	5 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.25-1.5M							
63	BH0021 - 1.5-1.75M	Sep 11, 2019		Soil	B19-Se24895	X		
64	BH0021 - 1.75-2.0M	Sep 11, 2019		Soil	B19-Se24896	X		
65	BH0021 - 2.00-2.25M	Sep 11, 2019		Soil	B19-Se24897	X	X	X
66	BH0021 - 2.25-2.5M	Sep 11, 2019		Soil	B19-Se24898	X		
67	BH0021 - 2.5-2.75M	Sep 11, 2019		Soil	B19-Se24899	X		
68	BH0021 - 2.75-3.00M	Sep 11, 2019		Soil	B19-Se24900	X		
69	BH0021 -	Sep 11, 2019		Soil	B19-Se24901	X		

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Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	5 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	3.00-3.25M							
70	BH0021 - 3.25-3.5M	Sep 11, 2019		Soil	B19-Se24902	X		
71	BH0021 - 3.5-3.75M	Sep 11, 2019		Soil	B19-Se24903	X		
72	BH0021 - 3.75-4.0M	Sep 11, 2019		Soil	B19-Se24904	X		
73	BH0022 - 0.0-0.25M	Sep 11, 2019		Soil	B19-Se24905	X		
74	BH0022 - 0.25-0.5M	Sep 11, 2019		Soil	B19-Se24906	X		
75	BH0022 - 0.5-0.75M	Sep 11, 2019		Soil	B19-Se24907	X		
76	BH0022 -	Sep 11, 2019		Soil	B19-Se24908	X	X	X

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 16, 2019 9:00 AM
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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	0.75-1.00M							
77	BH0022 - 1.00-1.25M	Sep 11, 2019		Soil	B19-Se24909	X		
78	BH0022 - 1.25-1.5M	Sep 11, 2019		Soil	B19-Se24910	X		
79	BH0022 - 1.5-1.75M	Sep 11, 2019		Soil	B19-Se24911	X		
80	BH0022 - 1.75-2.00M	Sep 11, 2019		Soil	B19-Se24912	X	X	X
81	BH0022 - 2.0-2.25M	Sep 11, 2019		Soil	B19-Se24913	X		
82	BH0022 - 2.25-2.5M	Sep 11, 2019		Soil	B19-Se24914	X		
Test Counts						82	19	19

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.
- 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.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- 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

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

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

QC Data General Comments

- 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.
- 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.
- Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
- 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.
- 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.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
- For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery										
Chromium Suite (SKCI)										
Chromium Reducible Sulfur				%	102			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1				Acceptance Limits	Pass Limits	Qualifying Code
Duplicate										
Chromium Suite (SKCI)										
				Result 1	Result 2	RPD				
pH-KCL	B19-Se24834	CP	pH Units	5.5	5.5	<1		30%	Pass	
Acid trail - Titratable Actual Acidity	B19-Se24834	CP	mol H+/t	9.0	8.1	10		30%	Pass	
sulfidic - TAA equiv. S% pyrite	B19-Se24834	CP	% pyrite S	0.010	0.010	10		30%	Pass	
Chromium Reducible Sulfur	B19-Se24834	CP	% S	< 0.005	< 0.005	<1		30%	Pass	
Chromium Reducible Sulfur -acidity units	B19-Se24834	CP	mol H+/t	< 3	< 3	<1		30%	Pass	
Sulfur - KCl Extractable	B19-Se24834	CP	% S	< 0.02	< 0.02	<1		30%	Pass	
Net Acid soluble sulfur	B19-Se24834	CP	% S	n/a	n/a	n/a		30%	Pass	
Net Acid soluble sulfur - acidity units	B19-Se24834	CP	mol H+/t	n/a	n/a	n/a		30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	B19-Se24834	CP	% S	n/a	n/a	n/a		30%	Pass	
Acid Neutralising Capacity (ANCbt)	B19-Se24834	CP	% CaCO3	n/a	n/a	n/a		30%	Pass	
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	B19-Se24834	CP	% S	n/a	n/a	n/a		30%	Pass	
ANC Fineness Factor	B19-Se24834	CP	factor	1.5	1.5	<1		30%	Pass	
CRS Suite - Net Acidity (Sulfur Units)	B19-Se24834	CP	% S	< 0.02	< 0.02	<1		30%	Pass	
CRS Suite - Net Acidity (Acidity Units)	B19-Se24834	CP	mol H+/t	< 10	< 10	<1		30%	Pass	
CRS Suite - Liming Rate	B19-Se24834	CP	kg CaCO3/t	< 1	< 1	<1		30%	Pass	
Duplicate										
				Result 1	Result 2	RPD				
% Moisture	S19-Se23892	NCP	%	6.7	6.8	1.0		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test										
				Result 1	Result 2	RPD				
pH-F (Field pH test)*	B19-Se24840	CP	pH Units	6.3	6.6	pass		30%	Pass	
Reaction Ratings*	B19-Se24840	CP	comment	2.0	2.0	pass		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test										
				Result 1	Result 2	RPD				
pH-F (Field pH test)*	B19-Se24850	CP	pH Units	7.1	7.2	pass		30%	Pass	
Reaction Ratings*	B19-Se24850	CP	comment	3.0	3.0	pass		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test										
				Result 1	Result 2	RPD				
pH-F (Field pH test)*	B19-Se24860	CP	pH Units	6.6	6.5	pass		30%	Pass	
Reaction Ratings*	B19-Se24860	CP	comment	3.0	3.0	pass		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test										
				Result 1	Result 2	RPD				
pH-F (Field pH test)*	B19-Se24870	CP	pH Units	5.9	5.9	pass		30%	Pass	
Reaction Ratings*	B19-Se24870	CP	comment	1.0	1.0	pass		30%	Pass	
Duplicate										
Chromium Suite (SKCI)										
				Result 1	Result 2	RPD				
pH-KCL	B19-Se24875	CP	pH Units	4.4	4.4	<1		30%	Pass	
Acid trail - Titratable Actual Acidity	B19-Se24875	CP	mol H+/t	57	58	1.6		30%	Pass	
sulfidic - TAA equiv. S% pyrite	B19-Se24875	CP	% pyrite S	0.090	0.090	2.0		30%	Pass	
Chromium Reducible Sulfur	B19-Se24875	CP	% S	< 0.005	< 0.005	<1		30%	Pass	
Chromium Reducible Sulfur -acidity units	B19-Se24875	CP	mol H+/t	< 3	< 3	<1		30%	Pass	

Duplicate								
Chromium Suite (SKCI)				Result 1	Result 2	RPD		
Sulfur - KCl Extractable	B19-Se24875	CP	% S	< 0.02	< 0.02	<1	30%	Pass
Net Acid soluble sulfur	B19-Se24875	CP	% S	0.03	0.03	18	30%	Pass
Net Acid soluble sulfur - acidity units	B19-Se24875	CP	mol H+/t	13	15	18	30%	Pass
Net Acid soluble sulfur - equivalent S% pyrite	B19-Se24875	CP	% S	0.02	0.02	18	30%	Pass
Acid Neutralising Capacity (ANCbt)	B19-Se24875	CP	% CaCO ₃	n/a	n/a	n/a	30%	Pass
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	B19-Se24875	CP	% S	n/a	n/a	n/a	30%	Pass
ANC Fineness Factor	B19-Se24875	CP	factor	1.5	1.5	<1	30%	Pass
CRS Suite - Net Acidity (Sulfur Units)	B19-Se24875	CP	% S	0.11	0.12	n/a	30%	Pass
CRS Suite - Net Acidity (Acidity Units)	B19-Se24875	CP	mol H+/t	69	73	n/a	30%	Pass
CRS Suite - Liming Rate	B19-Se24875	CP	kg CaCO ₃ /t	5.2	5.5	5.0	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se24880	CP	pH Units	5.2	5.2	pass	30%	Pass
Reaction Ratings*	B19-Se24880	CP	comment	1.0	1.0	pass	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se24890	CP	pH Units	4.0	4.0	pass	30%	Pass
Reaction Ratings*	B19-Se24890	CP	comment	2.0	2.0	pass	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se24900	CP	pH Units	7.0	6.9	pass	30%	Pass
Reaction Ratings*	B19-Se24900	CP	comment	2.0	2.0	pass	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se24910	CP	pH Units	5.2	5.2	pass	30%	Pass
Reaction Ratings*	B19-Se24910	CP	comment	1.0	1.0	pass	30%	Pass

Comments
Sample Integrity

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

Qualifier Codes/Comments

Code	Description
S01	Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO ₃) 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/m ³ in-situ soil' multiply 'reported results' x 'wet bulk density of soil in t/m ³ '
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5
S03	Acid Neutralising Capacity is only required if the pHKCl is 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
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised By

Ryan Gilbert	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](#).

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 Accreditation Number 1261
 Site Number 20794

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 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: - ALL INV & STATEMENTS

Report 677351-S
 Project name MIBA - NORTH HARBOUR
 Project ID 19210
 Received Date Sep 16, 2019

Client Sample ID			BH008 - 0.0-0.25M	BH008 - 0.25-0.5M	BH008 - 0.5-0.75M	BH008 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25107	B19-Se25108	B19-Se25109	B19-Se25110
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.8	5.6	4.9	5.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.2	3.4	3.5	3.7
Reaction Ratings* ^{S05}		comment	4.0	3.0	3.0	3.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.3	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	73	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.12	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	< 0.02	-	-
Net Acid soluble sulfur	0.02	% S	-	< 0.02	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	< 10	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	< 0.02	-	-
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	-	0.12	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	73	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	5.5	-	-
<2mm Fraction	0.005	g	-	110	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	17	-	-

Client Sample ID			BH008 - 1.00-1.25M	BH008 - 1.25-1.5M	BH008 - 1.5-1.75M	BH008 - 1.75-2.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25111	B19-Se25112	B19-Se25113	B19-Se25114
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.8	4.8	4.8	4.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.6	3.9	3.8	3.8
Reaction Ratings* ^{S05}		comment	2.0	1.0	1.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.9	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	12	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.020	-	-	-
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	< 0.02	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-
HCl Extractable Sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	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	0.02	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	12	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	< 1	-	-	-
<2mm Fraction	0.005	g	140	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture						
	1	%	11	-	-	-

Client Sample ID			BH009 - 0.0-0.25M	BH009 - 0.25-0.5M	BH009 - 0.5-0.75M	BH009 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25115	B19-Se25116	B19-Se25117	B19-Se25118
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.6	4.6	4.4	4.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.1	3.3	3.4	3.4
Reaction Ratings* ^{S05}		comment	3.0	2.0	3.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.3	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	87	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.14	-	-	-
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	< 0.02	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-

Client Sample ID			BH009 - 0.0-0.25M	BH009 - 0.25-0.5M	BH009 - 0.5-0.75M	BH009 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25115	B19-Se25116	B19-Se25117	B19-Se25118
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	0.03	-	-	-
Net Acid soluble sulfur	0.02	% S	0.03	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	16	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	0.03	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	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	0.17	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	100	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	7.7	-	-	-
<2mm Fraction	0.005	g	84	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture	1	%	22	-	-	-

Client Sample ID			BH009 - 1.00-1.25M	BH009 - 1.25-1.5M	BH009 - 1.5-1.75M	BH009 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25119	B19-Se25120	B19-Se25121	B19-Se25122
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.5	4.8	4.7	4.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.3	3.7	3.6	3.7
Reaction Ratings ^{S05}		comment	2.0	2.0	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	4.5
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	32
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.050
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	-	-	-	0.05
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	0.09
Net Acid soluble sulfur	0.02	% S	-	-	-	0.04
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	18
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	0.03
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	-	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	-	-	-	0.08
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	50

Client Sample ID			BH009 - 1.00-1.25M	BH009 - 1.25-1.5M	BH009 - 1.5-1.75M	BH009 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25119	B19-Se25120	B19-Se25121	B19-Se25122
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	3.8
<2mm Fraction	0.005	g	-	-	-	150
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture	1	%	-	-	-	14

Client Sample ID			BH010 - 0.00-0.25M	BH010 - 0.25-0.5M	BH010 - 0.5-0.75M	BH010 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25123	B19-Se25124	B19-Se25125	B19-Se25126
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.7	5.2	5.1	4.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.2	3.4	3.8	3.6
Reaction Ratings* ^{S05}		comment	4.0	4.0	2.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.4	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	57	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.090	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	0.04	-	-
Net Acid soluble sulfur	0.02	% S	-	0.04	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	19	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	0.03	-	-
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	-	0.12	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	76	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	5.7	-	-
<2mm Fraction	0.005	g	-	85	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	17	-	-

Client Sample ID			BH010 - 1.00-1.25M	BH010 - 1.25-1.5M	BH010 - 1.5-1.75M	BH010 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25127	B19-Se25128	B19-Se25129	B19-Se25130
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.7	4.9	5.0	5.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.9	3.9	4.4	4.6
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.9	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	20	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.030	-	-	-
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	0.04	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-
HCl Extractable Sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	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	0.03	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	20	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	1.5	-	-	-
<2mm Fraction	0.005	g	79	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture	1	%	17	-	-	-

Client Sample ID			BH011 - 0.00-0.25M	BH011 - 0.25-0.5M	BH011 - 0.5-0.75M	BH011 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25131	B19-Se25132	B19-Se25133	B19-Se25134
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.1	4.5	4.1	4.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.3	2.8	3.2	3.3
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.6	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	58	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.090	-	-	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	0.006	-	-	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	3.7	-	-	-
Sulfur - KCl Extractable	0.02	% S	0.03	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-

Client Sample ID			BH011 - 0.00-0.25M	BH011 - 0.25-0.5M	BH011 - 0.5-0.75M	BH011 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25131	B19-Se25132	B19-Se25133	B19-Se25134
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	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	0.10	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	62	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	4.7	-	-	-
<2mm Fraction	0.005	g	39	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture	1	%	17	-	-	-

Client Sample ID			BH011 - 1.00-1.25M	BH011 - 1.25-1.5M	BH011 - 1.5-1.75M	BH011 - 1.75-2.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25135	B19-Se25136	B19-Se25137	B19-Se25138
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	3.9	3.9	4.0	4.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.0	3.0	2.9	2.7
Reaction Ratings ^{S05}		comment	2.0	2.0	2.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	4.1	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	110	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.18	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	-	0.005	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	-	3.2	-
Sulfur - KCl Extractable	0.02	% S	-	-	0.07	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	0.13	-
Net Acid soluble sulfur	0.02	% S	-	-	0.06	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	28	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	0.04	-
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	-	-	0.23	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	140	-

Client Sample ID			BH011 - 1.00-1.25M	BH011 - 1.25-1.5M	BH011 - 1.5-1.75M	BH011 - 1.75-2.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25135	B19-Se25136	B19-Se25137	B19-Se25138
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	11	-
<2mm Fraction	0.005	g	-	-	89	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture						
	1	%	-	-	27	-

Client Sample ID			BH011 - 2.00-2.25M	BH011 - 2.25-2.5M	BH011 - 2.5-2.75M	BH011 - 2.75-3.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25139	B19-Se25140	B19-Se25141	B19-Se25142
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.4	4.3	4.5	4.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.9	2.8	3.4	3.5
Reaction Ratings* ^{S05}		comment	2.0	2.0	4.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	4.3
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	41
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.070
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	-	-	-	0.04
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	0.07
Net Acid soluble sulfur	0.02	% S	-	-	-	0.03
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	14
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	0.02
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	-	-	-	0.09
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	55
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	4.2
<2mm Fraction	0.005	g	-	-	-	100
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture						
	1	%	-	-	-	21

Client Sample ID			BH012 - 0.00-0.25M	BH012 - 0.25-0.5M	BH012 - 0.5-0.75M	BH012 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25143	B19-Se25144	B19-Se25145	B19-Se25146
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.4	5.7	5.3	4.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.3	4.2	3.5	3.8
Reaction Ratings* ^{S05}		comment	4.0	2.0	3.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	4.6	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	27	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.040	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	-	0.005	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	-	3.3	-
Sulfur - KCl Extractable	0.02	% S	-	-	0.03	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	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	-	-	0.05	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	30	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	2.3	-
<2mm Fraction	0.005	g	-	-	170	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture	1	%	-	-	13	-

Client Sample ID			BH012 - 1.00-1.25M	BH012 - 1.25-1.5M	BH012 - 1.5-1.75M	BH012 - 1.75-2.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25147	B19-Se25148	B19-Se25149	B19-Se25150
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.8	4.9	4.9	5.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.0	4.1	4.3	4.4
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	4.5
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	27
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.040
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	-	-	-	0.04
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0

Client Sample ID			BH012 - 1.00-1.25M	BH012 - 1.25-1.5M	BH012 - 1.5-1.75M	BH012 - 1.75-2.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25147	B19-Se25148	B19-Se25149	B19-Se25150
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	-	-	0.08
Net Acid soluble sulfur	0.02	% S	-	-	-	0.04
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	21
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	0.03
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	-	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	-	-	-	0.08
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	47
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	-	3.6
<2mm Fraction	0.005	g	-	-	-	100
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture	1	%	-	-	-	20

Client Sample ID			BH013 - 0.00-0.25M	BH013 - 0.25-0.5M	BH013 - 0.5-0.75M	BH013 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25151	B19-Se25152	B19-Se25153	B19-Se25154
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.0	5.9	6.2	6.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.0	3.1	3.1	4.9
Reaction Ratings ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	4.6	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	40	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	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	-	-	40	-

Client Sample ID			BH013 - 0.00-0.25M	BH013 - 0.25-0.5M	BH013 - 0.5-0.75M	BH013 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25151	B19-Se25152	B19-Se25153	B19-Se25154
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	3.0	-
<2mm Fraction	0.005	g	-	-	84	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture						
	1	%	-	-	16	-

Client Sample ID			BH013 - 1.00-1.25M	BH013 - 1.25-1.5M	BH013 - 1.5-1.75M	BH013 - 1.75-2.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25155	B19-Se25156	B19-Se25157	B19-Se25158
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.8	7.3	7.3	7.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.3	6.2	6.6	6.3
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	6.1
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	4.4
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.010
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	-	-	-	0.04
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	-	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	-	-	-	< 0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	< 10
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	< 1
<2mm Fraction	0.005	g	-	-	-	130
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture						
	1	%	-	-	-	21

Client Sample ID			BH013 - 2.00-2.25M	BH013 - 2.25-2.5M	BH013 - 2.5-2.75M	BH013 - 2.75-3.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25159	B19-Se25160	B19-Se25161	B19-Se25162
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.4	7.3	7.4	7.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.2	6.2	6.6	6.9
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0

Client Sample ID			BH013 - 3.00-3.25M	BH013 - 3.25-3.5M	BH023 - 0.00-0.25M	BH023 - 0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25163	B19-Se25164	B19-Se25165	B19-Se25166
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.7	8.0	4.8	4.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.3	7.0	3.0	3.2
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	6.1	-	4.4	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	3.5	-	110	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.010	-	0.18	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	0.007	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	4.1	-
Sulfur - KCl Extractable	0.02	% S	0.03	-	0.03	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	2.0	-
HCl Extractable Sulfur	0.02	% S	n/a	-	0.09	-
Net Acid soluble sulfur	0.02	% S	n/a	-	0.06	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	26	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	0.04	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	n/a	-	n/a	-
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	n/a	-	n/a	-
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	n/a	-
ANC Fineness Factor		factor	1.5	-	1.5	-
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	< 0.02	-	0.23	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	< 10	-	140	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	< 1	-	11	-
<2mm Fraction	0.005	g	140	-	33	-
>2mm Fraction	0.005	g	< 0.005	-	< 0.005	-
Analysed Material	0.1	%	100	-	100	-
Extraneous Material	0.1	%	< 0.1	-	< 0.1	-
% Moisture						
	1	%	19	-	19	-

Client Sample ID			BH023 - 0.5-0.75M	BH023 - 0.75-1.00M	BH023 - 1.00-1.25M	BH023 - 1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25167	B19-Se25168	B19-Se25169	B19-Se25170
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.1	4.1	4.5	4.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.0	2.9	2.8	1.4
Reaction Ratings**S05		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	4.2
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	120
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.19
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	-	-	1.9
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	-	-	1200
Sulfur - KCl Extractable	0.02	% S	-	-	-	0.14
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	0.22
Net Acid soluble sulfur	0.02	% S	-	-	-	0.08
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	37
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	0.06
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	-	-	-	2.2
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	1400
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	100
<2mm Fraction	0.005	g	-	-	-	44
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture	1	%	-	-	-	44

Client Sample ID			BH023 - 1.5-1.75M	BH023 - 1.75-2.00M	BH023 - 2.00-2.25M	BH023 - 2.25-2.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25171	B19-Se25172	B19-Se25173	B19-Se25174
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.4	4.7	4.5	4.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	1.7	1.8	1.8	1.8
Reaction Ratings**S05		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	4.5
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	34
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.050
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	-	-	0.50
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	-	-	310
Sulfur - KCl Extractable	0.02	% S	-	-	-	0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0

Client Sample ID			BH023 - 1.5-1.75M	BH023 - 1.75-2.00M	BH023 - 2.00-2.25M	BH023 - 2.25-2.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25171	B19-Se25172	B19-Se25173	B19-Se25174
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	-	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	-	-	-	0.55
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	340
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	-	26
<2mm Fraction	0.005	g	-	-	-	91
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture	1	%	-	-	-	20

Client Sample ID			BH024 - 0.00-0.25M	BH024 - 0.25-0.5M	BH024 - 0.5-0.75M	BH024 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25175	B19-Se25176	B19-Se25177	B19-Se25178
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.8	4.4	4.2	4.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.1	3.3	2.8	3.0
Reaction Ratings ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	4.3
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	87
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.14
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	-	-	0.006
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	-	-	3.8
Sulfur - KCl Extractable	0.02	% S	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	< 0.02
Net Acid soluble sulfur	0.02	% S	-	-	-	< 0.02
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	< 10
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	< 0.02
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	-	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	-	-	-	0.14
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	90

Client Sample ID			BH024 - 0.00-0.25M	BH024 - 0.25-0.5M	BH024 - 0.5-0.75M	BH024 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25175	B19-Se25176	B19-Se25177	B19-Se25178
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	6.8
<2mm Fraction	0.005	g	-	-	-	120
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture	1	%	-	-	-	20

Client Sample ID			BH024 - 1.00-1.25M	BH024 - 1.25-1.5M	BH024 - 1.5-1.75M	BH024 - 2.00-2.25M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25179	B19-Se25180	B19-Se25181	B19-Se25183
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.9	5.1	4.4	4.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.7	2.2	2.6	2.8
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	4.3	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	120	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.19	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	-	0.044	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	-	28	-
Sulfur - KCl Extractable	0.02	% S	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	0.03	-
Net Acid soluble sulfur	0.02	% S	-	-	0.03	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	16	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	0.03	-
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	-	-	0.26	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	160	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	12	-
<2mm Fraction	0.005	g	-	-	45	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture	1	%	-	-	28	-

Client Sample ID			BH024 - 2.25-2.5M
Sample Matrix			Soil
Eurofins Sample No.			B19-Se25184
Date Sampled			Sep 12, 2019
Test/Reference	LOR	Unit	
Acid Sulfate Soils Field pH Test			
pH-F (Field pH test)*	0.1	pH Units	4.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.3
Reaction Ratings* ^{S05}		comment	4.0

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

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 - Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests	Brisbane	Sep 18, 2019	7 Days
Chromium Suite (SKCI) - Method: LTM-GEN-7070	Brisbane	Sep 24, 2019	6 Week
% Moisture - Method: LTM-GEN-7080 Moisture	Brisbane	Sep 16, 2019	14 Days

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Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	5 Day
Project ID:	19210	Fax:		Contact Name:	- ALL INV & STATEMENTS

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						CANCELLED	HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Sulite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794						X	X	X	X	X
Perth Laboratory - NATA Site # 23736										
External Laboratory										
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID					
1	BH008 - 0.0-0.25M	Sep 12, 2019		Soil	B19-Se25107			X		
2	BH008 - 0.25-0.5M	Sep 12, 2019		Soil	B19-Se25108			X	X	X
3	BH008 - 0.5-0.75M	Sep 12, 2019		Soil	B19-Se25109			X		
4	BH008 - 0.75-1.00M	Sep 12, 2019		Soil	B19-Se25110			X		
5	BH008 - 1.00-1.25M	Sep 12, 2019		Soil	B19-Se25111			X	X	X
6	BH008 - 1.25-	Sep 12, 2019		Soil	B19-Se25112			X		

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						CANCELLED	HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Sulfite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794						X	X	X	X	X
Perth Laboratory - NATA Site # 23736										
	1.5M									
7	BH008 - 1.5-1.75M	Sep 12, 2019		Soil	B19-Se25113			X		
8	BH008 - 1.75-2.00M	Sep 12, 2019		Soil	B19-Se25114			X		
9	BH009 - 0.0-0.25M	Sep 12, 2019		Soil	B19-Se25115			X	X	X
10	BH009 - 0.25-0.5M	Sep 12, 2019		Soil	B19-Se25116			X		
11	BH009 - 0.5-0.75M	Sep 12, 2019		Soil	B19-Se25117			X		
12	BH009 - 0.75-1.00M	Sep 12, 2019		Soil	B19-Se25118			X		
13	BH009 - 1.00-	Sep 12, 2019		Soil	B19-Se25119			X		

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						CANCELLED	HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Sulfite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794						X	X	X	X	X
Perth Laboratory - NATA Site # 23736										
	1.25M									
14	BH009 - 1.25-1.5M	Sep 12, 2019		Soil	B19-Se25120			X		
15	BH009 - 1.5-1.75M	Sep 12, 2019		Soil	B19-Se25121			X		
16	BH009 - 1.75-2.0M	Sep 12, 2019		Soil	B19-Se25122			X	X	X
17	BH010 - 0.00-0.25M	Sep 12, 2019		Soil	B19-Se25123			X		
18	BH010 - 0.25-0.5M	Sep 12, 2019		Soil	B19-Se25124			X	X	X
19	BH010 - 0.5-0.75M	Sep 12, 2019		Soil	B19-Se25125			X		
20	BH010 - 0.75-	Sep 12, 2019		Soil	B19-Se25126			X		

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						CANCELLED	HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Sulfite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794						X	X	X	X	X
Perth Laboratory - NATA Site # 23736										
	1.00M									
21	BH010 - 1.00-1.25M	Sep 12, 2019		Soil	B19-Se25127			X	X	X
22	BH010 - 1.25-1.5M	Sep 12, 2019		Soil	B19-Se25128			X		
23	BH010 - 1.5-1.75M	Sep 12, 2019		Soil	B19-Se25129			X		
24	BH010 - 1.75-2.0M	Sep 12, 2019		Soil	B19-Se25130			X		
25	BH011 - 0.00-0.25M	Sep 12, 2019		Soil	B19-Se25131			X	X	X
26	BH011 - 0.25-0.5M	Sep 12, 2019		Soil	B19-Se25132			X		
27	BH011 - 0.5-	Sep 12, 2019		Soil	B19-Se25133			X		

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						CANCELLED	HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Sulfite (SKCl)
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794						X	X	X	X	X
Perth Laboratory - NATA Site # 23736										
	0.75M									
28	BH011 - 0.75-1.00M	Sep 12, 2019		Soil	B19-Se25134			X		
29	BH011 - 1.00-1.25M	Sep 12, 2019		Soil	B19-Se25135			X		
30	BH011 - 1.25-1.5M	Sep 12, 2019		Soil	B19-Se25136			X		
31	BH011 - 1.5-1.75M	Sep 12, 2019		Soil	B19-Se25137			X	X	X
32	BH011 - 1.75-2.00M	Sep 12, 2019		Soil	B19-Se25138			X		
33	BH011 - 2.00-2.25M	Sep 12, 2019		Soil	B19-Se25139			X		
34	BH011 - 2.25-	Sep 12, 2019		Soil	B19-Se25140			X		

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						CANCELLED	HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Sulfate (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794						X	X	X	X	X
Perth Laboratory - NATA Site # 23736										
	2.5M									
35	BH011 - 2.5-2.75M	Sep 12, 2019		Soil	B19-Se25141			X		
36	BH011 - 2.75-3.00M	Sep 12, 2019		Soil	B19-Se25142			X	X	X
37	BH012 - 0.00-0.25M	Sep 12, 2019		Soil	B19-Se25143			X		
38	BH012 - 0.25-0.5M	Sep 12, 2019		Soil	B19-Se25144			X		
39	BH012 - 0.5-0.75M	Sep 12, 2019		Soil	B19-Se25145			X	X	X
40	BH012 - 0.75-1.00M	Sep 12, 2019		Soil	B19-Se25146			X		
41	BH012 - 1.00-	Sep 12, 2019		Soil	B19-Se25147			X		

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Sample Detail						CANCELLED	HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Sulfite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794						X	X	X	X	X
Perth Laboratory - NATA Site # 23736										
	1.25M									
42	BH012 - 1.25-1.5M	Sep 12, 2019		Soil	B19-Se25148			X		
43	BH012 - 1.5-1.75M	Sep 12, 2019		Soil	B19-Se25149			X		
44	BH012 - 1.75-2.00M	Sep 12, 2019		Soil	B19-Se25150			X	X	X
45	BH013 - 0.00-0.25M	Sep 12, 2019		Soil	B19-Se25151			X		
46	BH013 - 0.25-0.5M	Sep 12, 2019		Soil	B19-Se25152			X		
47	BH013 - 0.5-0.75M	Sep 12, 2019		Soil	B19-Se25153			X	X	X
48	BH013 - 0.75-	Sep 12, 2019		Soil	B19-Se25154			X		

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						CANCELLED	HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Sulfite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794						X	X	X	X	X
Perth Laboratory - NATA Site # 23736										
	1.00M									
49	BH013 - 1.00-1.25M	Sep 12, 2019		Soil	B19-Se25155			X		
50	BH013 - 1.25-1.5M	Sep 12, 2019		Soil	B19-Se25156			X		
51	BH013 - 1.5-1.75M	Sep 12, 2019		Soil	B19-Se25157			X		
52	BH013 - 1.75-2.00M	Sep 12, 2019		Soil	B19-Se25158			X	X	X
53	BH013 - 2.00-2.25M	Sep 12, 2019		Soil	B19-Se25159			X		
54	BH013 - 2.25-2.5M	Sep 12, 2019		Soil	B19-Se25160			X		
55	BH013 - 2.5-	Sep 12, 2019		Soil	B19-Se25161			X		

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Sample Detail						CANCELLED	HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Sulfite (SKCl)
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794						X	X	X	X	X
Perth Laboratory - NATA Site # 23736										
	2.75M									
56	BH013 - 2.75-3.00M	Sep 12, 2019		Soil	B19-Se25162			X		
57	BH013 - 3.00-3.25M	Sep 12, 2019		Soil	B19-Se25163			X	X	X
58	BH013 - 3.25-3.5M	Sep 12, 2019		Soil	B19-Se25164			X		
59	BH023 - 0.00-0.25M	Sep 12, 2019		Soil	B19-Se25165			X	X	X
60	BH023 - 0.25-0.5M	Sep 12, 2019		Soil	B19-Se25166			X		
61	BH023 - 0.5-0.75M	Sep 12, 2019		Soil	B19-Se25167			X		
62	BH023 - 0.75-	Sep 12, 2019		Soil	B19-Se25168			X		

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						CANCELLED	HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Sulfite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794						X	X	X	X	X
Perth Laboratory - NATA Site # 23736										
	1.00M									
63	BH023 - 1.00-1.25M	Sep 12, 2019		Soil	B19-Se25169			X		
64	BH023 - 1.25-1.5M	Sep 12, 2019		Soil	B19-Se25170			X	X	X
65	BH023 - 1.5-1.75M	Sep 12, 2019		Soil	B19-Se25171			X		
66	BH023 - 1.75-2.00M	Sep 12, 2019		Soil	B19-Se25172			X		
67	BH023 - 2.00-2.25M	Sep 12, 2019		Soil	B19-Se25173			X		
68	BH023 - 2.25-2.5M	Sep 12, 2019		Soil	B19-Se25174			X	X	X
69	BH024 - 0.00-	Sep 12, 2019		Soil	B19-Se25175			X		

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						CANCELLED	HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Sulfite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794						X	X	X	X	X
Perth Laboratory - NATA Site # 23736										
	0.25M									
70	BH024 - 0.25-0.5M	Sep 12, 2019		Soil	B19-Se25176			X		
71	BH024 - 0.5-0.75M	Sep 12, 2019		Soil	B19-Se25177			X		
72	BH024 - 0.75-1.00M	Sep 12, 2019		Soil	B19-Se25178			X	X	X
73	BH024 - 1.00-1.25M	Sep 12, 2019		Soil	B19-Se25179			X		
74	BH024 - 1.25-1.5M	Sep 12, 2019		Soil	B19-Se25180			X		
75	BH024 - 1.5-1.75M	Sep 12, 2019		Soil	B19-Se25181			X	X	X
76	BH024 - 1.75-	Sep 12, 2019		Soil	B19-Se25182	X				

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						CANCELLED	HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794						X	X	X	X	X
Perth Laboratory - NATA Site # 23736										
	2.00M									
77	BH024 - 2.00-2.25M	Sep 12, 2019		Soil	B19-Se25183			X		
78	BH024 - 2.25-2.5M	Sep 12, 2019		Soil	B19-Se25184			X		
79	BH023 - 2.5-2.75M	Sep 12, 2019		Soil	B19-Se25237		X			
80	BH023 - 2.75-3.00M	Sep 12, 2019		Soil	B19-Se25238		X			
Test Counts						1	2	77	19	19

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.
- 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.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- 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

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

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

QC Data General Comments

- 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.
- 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.
- Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
- 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.
- 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.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
- For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery										
Chromium Suite (SKCI)										
Chromium Reducible Sulfur				%	98			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1				Acceptance Limits	Pass Limits	Qualifying Code
Duplicate										
Chromium Suite (SKCI)										
				Result 1	Result 2	RPD				
pH-KCL	B19-Se25108	CP	pH Units	4.3	4.3	<1		30%	Pass	
Acid trail - Titratable Actual Acidity	B19-Se25108	CP	mol H+/t	73	73	<1		30%	Pass	
sulfidic - TAA equiv. S% pyrite	B19-Se25108	CP	% pyrite S	0.12	0.12	<1		30%	Pass	
Chromium Reducible Sulfur	B19-Se25108	CP	% S	< 0.005	< 0.005	<1		30%	Pass	
Chromium Reducible Sulfur -acidity units	B19-Se25108	CP	mol H+/t	< 3	< 3	<1		30%	Pass	
Sulfur - KCl Extractable	B19-Se25108	CP	% S	< 0.02	< 0.02	<1		30%	Pass	
Net Acid soluble sulfur	B19-Se25108	CP	% S	< 0.02	< 0.02	<1		30%	Pass	
Net Acid soluble sulfur - acidity units	B19-Se25108	CP	mol H+/t	< 10	< 10	<1		30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	B19-Se25108	CP	% S	< 0.02	< 0.02	<1		30%	Pass	
Acid Neutralising Capacity (ANCbt)	B19-Se25108	CP	% CaCO ₃	n/a	n/a	n/a		30%	Pass	
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	B19-Se25108	CP	% S	n/a	n/a	n/a		30%	Pass	
ANC Fineness Factor	B19-Se25108	CP	factor	1.5	1.5	<1		30%	Pass	
CRS Suite - Net Acidity (Sulfur Units)	B19-Se25108	CP	% S	0.12	0.12	n/a		30%	Pass	
CRS Suite - Net Acidity (Acidity Units)	B19-Se25108	CP	mol H+/t	73	73	n/a		30%	Pass	
CRS Suite - Liming Rate	B19-Se25108	CP	kg CaCO ₃ /t	5.5	5.5	<1		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test										
				Result 1	Result 2	RPD				
pH-F (Field pH test)*	B19-Se25111	CP	pH Units	4.8	4.9	pass		30%	Pass	
Reaction Ratings*	B19-Se25111	CP	comment	2.0	2.0	pass		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test										
				Result 1	Result 2	RPD				
pH-F (Field pH test)*	B19-Se25121	CP	pH Units	4.7	4.6	pass		30%	Pass	
Reaction Ratings*	B19-Se25121	CP	comment	2.0	2.0	pass		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test										
				Result 1	Result 2	RPD				
pH-F (Field pH test)*	B19-Se25131	CP	pH Units	5.1	5.0	pass		30%	Pass	
Reaction Ratings*	B19-Se25131	CP	comment	4.0	4.0	pass		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test										
				Result 1	Result 2	RPD				
pH-F (Field pH test)*	B19-Se25141	CP	pH Units	4.5	4.6	pass		30%	Pass	
Reaction Ratings*	B19-Se25141	CP	comment	4.0	4.0	pass		30%	Pass	
Duplicate										
Chromium Suite (SKCI)										
				Result 1	Result 2	RPD				
pH-KCL	B19-Se25150	CP	pH Units	4.5	4.5	<1		30%	Pass	
Acid trail - Titratable Actual Acidity	B19-Se25150	CP	mol H+/t	27	26	1.9		30%	Pass	
sulfidic - TAA equiv. S% pyrite	B19-Se25150	CP	% pyrite S	0.040	0.040	2.0		30%	Pass	
Chromium Reducible Sulfur	B19-Se25150	CP	% S	< 0.005	< 0.005	<1		30%	Pass	
Chromium Reducible Sulfur -acidity units	B19-Se25150	CP	mol H+/t	< 3	< 3	<1		30%	Pass	
Sulfur - KCl Extractable	B19-Se25150	CP	% S	0.04	0.04	1.0		30%	Pass	
Net Acid soluble sulfur	B19-Se25150	CP	% S	0.04	0.05	2.0		30%	Pass	

Duplicate								
Chromium Suite (SKCI)				Result 1	Result 2	RPD		
Net Acid soluble sulfur - acidity units	B19-Se25150	CP	mol H+/t	21	21	2.0	30%	Pass
Net Acid soluble sulfur - equivalent S% pyrite	B19-Se25150	CP	% S	0.03	0.03	2.0	30%	Pass
Acid Neutralising Capacity (ANCbt)	B19-Se25150	CP	% CaCO ₃	n/a	n/a	n/a	30%	Pass
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	B19-Se25150	CP	% S	n/a	n/a	n/a	30%	Pass
ANC Fineness Factor	B19-Se25150	CP	factor	1.5	1.5	<1	30%	Pass
CRS Suite - Net Acidity (Sulfur Units)	B19-Se25150	CP	% S	0.08	0.08	n/a	30%	Pass
CRS Suite - Net Acidity (Acidity Units)	B19-Se25150	CP	mol H+/t	47	47	n/a	30%	Pass
CRS Suite - Liming Rate	B19-Se25150	CP	kg CaCO ₃ /t	3.6	3.6	<1	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se25151	CP	pH Units	6.0	6.0	pass	30%	Pass
Reaction Ratings*	B19-Se25151	CP	comment	4.0	4.0	pass	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se25161	CP	pH Units	7.4	7.4	pass	30%	Pass
Reaction Ratings*	B19-Se25161	CP	comment	4.0	4.0	pass	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se25171	CP	pH Units	4.4	4.6	pass	30%	Pass
Reaction Ratings*	B19-Se25171	CP	comment	4.0	4.0	pass	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se25181	CP	pH Units	4.4	4.4	pass	30%	Pass
Reaction Ratings*	B19-Se25181	CP	comment	4.0	4.0	pass	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	B19-Se25183	CP	%	22	21	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	No

Qualifier Codes/Comments

Code	Description
S01	Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO ₃) 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/m ³ in-situ soil' multiply 'reported results' x 'wet bulk density of soil in t/m ³ '
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5
S03	Acid Neutralising Capacity is only required if the pHKCl is 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
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised By

Ryan Gilbert	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](#).

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 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: **Mark Thomson**

Report **677358-S**
 Project name **MIBA - NORTH HARBOUR**
 Project ID **19210**
 Received Date **Sep 16, 2019**

Client Sample ID			BH014 - 0.0-0.25M	BH014 - 0.25-0.5M	BH014 - 0.5-0.75M	BH014 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25023	B19-Se25024	B19-Se25025	B19-Se25026
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.9	6.0	6.9	7.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.4	4.2	5.1	6.6
Reaction Ratings* ^{S05}		comment	3.0	3.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.5	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	39	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	< 0.02	-	-
Net Acid soluble sulfur	0.02	% S	-	< 0.02	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	< 10	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	< 0.02	-	-
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	-	39	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	2.9	-	-
<2mm Fraction	0.005	g	-	130	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	14	-	-

Client Sample ID			BH014 - 1.00-1.25M	BH014 - 1.25-1.5M	BH014 - 1.5-1.75M	BH014 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25027	B19-Se25028	B19-Se25029	B19-Se25030
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.3	7.8	7.8	7.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.6	7.4	8.2	7.9
Reaction Ratings**S05		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	6.4	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	2.1	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	< 0.003	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	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	-	-	< 0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	< 10	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	< 1	-
<2mm Fraction	0.005	g	-	-	83	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture	1	%	-	-	12	-

Client Sample ID			BH014 - 2.00-2.25M	BH014 - 2.25-2.5M	BH014 - 2.5-2.75M	BH014 - 2.75-3.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25031	B19-Se25032	B19-Se25033	B19-Se25034
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.7	7.7	7.6	7.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.1	8.2	8.2	7.8
Reaction Ratings**S05		comment	4.0	4.0	4.0	4.0

Client Sample ID			BH014 - 3.00-3.25M	BH014 - 3.25-3.5M	BH015 - 0.0-0.25M	BH015 - 0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25035	B19-Se25036	B19-Se25037	B19-Se25038
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.6	7.5	5.1	5.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.2	8.2	2.5	3.0
Reaction Ratings**S05		comment	4.0	4.0	3.0	3.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	6.4	-	4.4	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	< 2	-	120	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	< 0.003	-	0.19	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	< 0.005	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	< 3	-
Sulfur - KCl Extractable	0.02	% S	0.02	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	2.0	-
HCl Extractable Sulfur	0.02	% S	n/a	-	< 0.02	-
Net Acid soluble sulfur	0.02	% S	n/a	-	< 0.02	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	< 10	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	< 0.02	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	n/a	-	n/a	-
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	n/a	-	n/a	-
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	n/a	-
ANC Fineness Factor		factor	1.5	-	1.5	-
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	< 0.02	-	0.19	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	< 10	-	120	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	< 1	-	8.7	-
<2mm Fraction	0.005	g	120	-	23	-
>2mm Fraction	0.005	g	< 0.005	-	< 0.005	-
Analysed Material	0.1	%	100	-	100	-
Extraneous Material	0.1	%	< 0.1	-	< 0.1	-
% Moisture	1	%	17	-	30	-

Client Sample ID			BH015 - 0.5-0.75M	BH015 - 0.75-1.00M	BH015 - 1.00-1.25M	BH015 - 1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25039	B19-Se25040	B19-Se25041	B19-Se25042
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.3	6.9	7.8	7.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.4	5.9	6.3	8.0
Reaction Ratings**S05		comment	3.0	4.0	3.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	5.7	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	12	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.020	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-

Client Sample ID			BH015 - 0.5-0.75M	BH015 - 0.75-1.00M	BH015 - 1.00-1.25M	BH015 - 1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25039	B19-Se25040	B19-Se25041	B19-Se25042
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	12	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	< 1	-	-
<2mm Fraction	0.005	g	-	92	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	21	-	-

Client Sample ID			BH015 - 1.5-1.75M	BH015 - 1.75-2.00M	BH015 - 2.00-2.25M	BH015 - 2.25-2.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25043	B19-Se25044	B19-Se25045	B19-Se25046
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.1	7.6	7.7	7.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.2	7.8	8.0	7.9
Reaction Ratings ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	6.6	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	< 2	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	< 0.003	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	-	< 0.005	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	-	< 3	-
Sulfur - KCl Extractable	0.02	% S	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	0.48	-
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	-	-	95	-
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	-	-	0.15	-
ANC Fineness Factor		factor	-	-	1.5	-
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	-	-	< 0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	< 10	-

Client Sample ID			BH015 - 1.5-1.75M	BH015 - 1.75-2.00M	BH015 - 2.00-2.25M	BH015 - 2.25-2.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25043	B19-Se25044	B19-Se25045	B19-Se25046
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	< 1	-
<2mm Fraction	0.005	g	-	-	110	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture						
	1	%	-	-	25	-

Client Sample ID			BH015 - 2.5-2.75M	BH015 - 2.75-3.00M	BH015 - 3.00-3.25M	BH015 - 3.25-3.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25047	B19-Se25048	B19-Se25049	B19-Se25050
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.8	8.1	8.1	7.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.1	8.6	8.5	8.3
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	6.3	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	2.3	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	< 0.003	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	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	-	-	< 0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	< 10	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	< 1	-
<2mm Fraction	0.005	g	-	-	87	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture						
	1	%	-	-	27	-

Client Sample ID			BH016 - 0.0-0.25M	BH016 - 0.25-0.5M	BH016 - 0.5-0.75M	BH016 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25051	B19-Se25052	B19-Se25053	B19-Se25054
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.9	6.2	6.5	6.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.2	3.4	4.2	6.0
Reaction Ratings**S05		comment	3.0	3.0	2.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	4.8	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	25	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.040	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	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	-	-	0.04	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	25	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	1.9	-
<2mm Fraction	0.005	g	-	-	110	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture	1	%	-	-	15	-

Client Sample ID			BH016 - 1.00-1.25M	BH016 - 1.25-1.5M	BH016 - 1.5-1.75M	BH016 - 1.75-2.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25055	B19-Se25056	B19-Se25057	B19-Se25058
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.4	7.5	8.0	8.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	6.4	6.5	8.6	8.5
Reaction Ratings**S05		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	6.7
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	< 2
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	< 0.003
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	-	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	-	-	< 3
Sulfur - KCl Extractable	0.02	% S	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0

Client Sample ID			BH016 - 1.00-1.25M	BH016 - 1.25-1.5M	BH016 - 1.5-1.75M	BH016 - 1.75-2.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25055	B19-Se25056	B19-Se25057	B19-Se25058
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	-	0.53
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	-	-	-	110
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	-	-	-	0.17
ANC Fineness Factor		factor	-	-	-	1.5
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	-	-	-	< 0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	< 10
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	-	< 1
<2mm Fraction	0.005	g	-	-	-	110
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture	1	%	-	-	-	5.0

Client Sample ID			BH016 - 2.00-2.25M	BH016 - 2.25-2.5M	BH016 - 2.5-2.75M	BH016 - 2.75-3.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25059	B19-Se25060	B19-Se25061	B19-Se25062
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.1	8.1	8.3	8.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.2	8.1	8.2	8.2
Reaction Ratings ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	6.6	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	< 2	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	< 0.003	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	-	< 0.005	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	-	< 3	-
Sulfur - KCl Extractable	0.02	% S	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	0.90	-
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	-	-	180	-
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	-	-	0.29	-
ANC Fineness Factor		factor	-	-	1.5	-
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	-	-	< 0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	< 10	-

Client Sample ID			BH016 - 2.00-2.25M	BH016 - 2.25-2.5M	BH016 - 2.5-2.75M	BH016 - 2.75-3.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25059	B19-Se25060	B19-Se25061	B19-Se25062
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	< 1	-
<2mm Fraction	0.005	g	-	-	140	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture						
	1	%	-	-	28	-

Client Sample ID			BH016 - 3.00-3.25M	BH016 - 3.25-3.5M	BH017 - 0.0-0.25M	BH017 - 0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25063	B19-Se25064	B19-Se25065	B19-Se25066
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.4	8.7	6.4	6.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.3	8.2	3.5	3.7
Reaction Ratings* ^{S05}		comment	4.0	4.0	3.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	5.0	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	22	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.030	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	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	-	-	0.03	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	22	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	1.6	-
<2mm Fraction	0.005	g	-	-	79	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture						
	1	%	-	-	39	-

Client Sample ID			BH017 - 0.5-0.75M	BH017 - 0.75-1.00M	BH017 - 1.00-1.25M	BH017 - 1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25067	B19-Se25068	B19-Se25069	B19-Se25070
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.9	7.0	7.1	7.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.9	6.3	7.0	6.9
Reaction Ratings**S05		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	5.6	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	13	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.020	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	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	-	-	0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	13	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	< 1	-
<2mm Fraction	0.005	g	-	-	110	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture	1	%	-	-	43	-

Client Sample ID			BH017 - 1.5-1.75M	BH017 - 1.75-2.00M	BH017 - 2.00-2.25M	BH017 - 2.25-2.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25071	B19-Se25072	B19-Se25073	B19-Se25074
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.4	7.3	7.7	7.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.6	7.5	6.7	7.5
Reaction Ratings**S05		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	5.7
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	5.4
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.010
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0

Client Sample ID			BH017 - 1.5-1.75M	BH017 - 1.75-2.00M	BH017 - 2.00-2.25M	BH017 - 2.25-2.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25071	B19-Se25072	B19-Se25073	B19-Se25074
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	-	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	-	-	-	< 0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	< 10
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	-	< 1
<2mm Fraction	0.005	g	-	-	-	100
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture	1	%	-	-	-	27

Client Sample ID			BH017 - 2.5-2.75M	BH017 - 2.75-3.00M	BH017 - 3.00-3.25M	BH017 - 3.25-3.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25075	B19-Se25076	B19-Se25077	B19-Se25078
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.5	7.7	7.5	7.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.1	6.7	6.4	6.3
Reaction Ratings ^{S05}		comment	2.0	4.0	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	5.6
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	5.8
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.010
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	-	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	-	-	-	< 0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	< 10

Client Sample ID			BH017 - 2.5-2.75M	BH017 - 2.75-3.00M	BH017 - 3.00-3.25M	BH017 - 3.25-3.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25075	B19-Se25076	B19-Se25077	B19-Se25078
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	< 1
<2mm Fraction	0.005	g	-	-	-	130
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture						
	1	%	-	-	-	22

Client Sample ID			BH019 - 0.00-0.25M	BH019 - 0.25-0.5M	BH019 - 0.5-0.75M	BH019 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25079	B19-Se25080	B19-Se25081	B19-Se25082
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.8	6.2	6.5	7.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.1	3.3	3.7	4.9
Reaction Ratings* ^{S05}		comment	3.0	4.0	4.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.8	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	38	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	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	-	38	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	2.9	-	-
<2mm Fraction	0.005	g	-	46	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	1	%	-	39	-	-

Client Sample ID			BH019 - 1.00-1.25M	BH019 - 1.25-1.5M	BH019 - 1.5-1.75M	BH019 - 1.75-2.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25083	B19-Se25084	B19-Se25085	B19-Se25086
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.0	6.8	7.5	7.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.2	6.0	6.8	6.9
Reaction Ratings**S05		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	5.6	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	8.0	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.010	-	-	-
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	< 0.02	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-
HCl Extractable Sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	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	< 0.02	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	< 10	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	< 1	-	-	-
<2mm Fraction	0.005	g	60	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture						
	1	%	33	-	-	-

Client Sample ID			BH019 - 2.00-2.25M	BH019 - 2.25-2.5M	BH019 - 2.5-2.75M	BH019 - 2.75-3.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25087	B19-Se25088	B19-Se25089	B19-Se25090
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.5	7.9	7.6	7.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	6.1	6.0	6.4	6.5
Reaction Ratings**S05		comment	2.0	2.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	5.7	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	5.4	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.010	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-

Client Sample ID			BH019 - 2.00-2.25M	BH019 - 2.25-2.5M	BH019 - 2.5-2.75M	BH019 - 2.75-3.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25087	B19-Se25088	B19-Se25089	B19-Se25090
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	< 0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	< 1	-	-
<2mm Fraction	0.005	g	-	120	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	35	-	-

Client Sample ID			BH019 - 3.00-3.25M	BH019 - 3.25-3.5M	BH020 - 0.0-0.25M	BH020 - 0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25091	B19-Se25092	B19-Se25093	B19-Se25094
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.6	7.5	6.2	6.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	6.7	7.0	3.7	3.9
Reaction Ratings ^{S05}		comment	4.0	4.0	3.0	3.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	5.6	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	7.9	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.010	-	-	-
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	< 0.02	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-
HCl Extractable Sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	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	< 0.02	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	< 10	-	-	-

Client Sample ID			BH019 - 3.00-3.25M	BH019 - 3.25-3.5M	BH020 - 0.0-0.25M	BH020 - 0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25091	B19-Se25092	B19-Se25093	B19-Se25094
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	< 1	-	-	-
<2mm Fraction	0.005	g	110	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture						
	1	%	26	-	-	-

Client Sample ID			BH020 - 0.5-0.75M	BH020 - 0.75-1.00M	BH020 - 1.00-1.25M	BH020 - 1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25095	B19-Se25096	B19-Se25097	B19-Se25098
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.3	6.0	6.3	6.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.0	4.4	4.5	4.4
Reaction Ratings* ^{S05}		comment	3.0	4.0	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	5.1	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	18	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.030	-	-	-
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	< 0.02	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-
HCl Extractable Sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	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	0.03	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	18	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	1.4	-	-	-
<2mm Fraction	0.005	g	59	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture						
	1	%	48	-	-	-

Client Sample ID			BH020 - 1.5-1.75M	BH020 - 1.75-2.00M	BH020 - 2.00-2.25M	BH020 - 2.25-2.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25099	B19-Se25100	B19-Se25101	B19-Se25102
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.3	7.4	7.1	7.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.2	2.4	2.2	2.2
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	5.4	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	12	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.020	-	-	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	0.86	-	-	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	540	-	-	-
Sulfur - KCl Extractable	0.02	% S	0.04	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-
HCl Extractable Sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	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	0.88	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	550	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	41	-	-	-
<2mm Fraction	0.005	g	85	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture	1	%	35	-	-	-

Client Sample ID			BH020 - 2.5-2.75M	BH020 - 2.75-3.00M	BH020 - 3.00-3.25M	BH020 - 3.25-3.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25103	B19-Se25104	B19-Se25105	B19-Se25106
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.9	6.5	6.3	6.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.2	2.6	2.5	2.7
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	5.5	-	-	5.8
Acid trail - Titratable Actual Acidity	2	mol H+/t	5.9	-	-	3.4
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.010	-	-	0.010
Chromium Reducible Sulfur ^{S04}	0.005	% S	0.40	-	-	0.070
Chromium Reducible Sulfur -acidity units	3	mol H+/t	250	-	-	44
Sulfur - KCl Extractable	0.02	% S	0.03	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	2.0

Client Sample ID			BH020 - 2.5-2.75M	BH020 - 2.75-3.00M	BH020 - 3.00-3.25M	BH020 - 3.25-3.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se25103	B19-Se25104	B19-Se25105	B19-Se25106
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	n/a	-	-	n/a
Net Acid soluble sulfur	0.02	% S	n/a	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	n/a	-	-	n/a
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	n/a	-	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	-	n/a
ANC Fineness Factor		factor	1.5	-	-	1.5
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	0.41	-	-	0.08
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	250	-	-	47
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	19	-	-	3.5
<2mm Fraction	0.005	g	90	-	-	97
>2mm Fraction	0.005	g	< 0.005	-	-	< 0.005
Analysed Material	0.1	%	100	-	-	100
Extraneous Material	0.1	%	< 0.1	-	-	< 0.1
% Moisture						
	1	%	23	-	-	19

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

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 - Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests	Brisbane	Sep 19, 2019	7 Days
Chromium Suite (SKCI) - Method: LTM-GEN-7070	Brisbane	Sep 24, 2019	6 Week
% Moisture - Method: LTM-GEN-7080 Moisture	Brisbane	Sep 16, 2019	14 Days

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 16, 2019 9:00 AM
Address:	40A Glen Vista Place Chevalum Qld 4555	Report #:	677358	Due:	Sep 23, 2019
Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	5 Day
Project ID:	19210	Fax:		Contact Name:	- ALL INV & STATEMENTS

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	BH014 - 0.0-0.25M	Sep 12, 2019		Soil	B19-Se25023	X		
2	BH014 - 0.25-0.5M	Sep 12, 2019		Soil	B19-Se25024	X	X	X
3	BH014 - 0.5-0.75M	Sep 12, 2019		Soil	B19-Se25025	X		
4	BH014 - 0.75-1.00M	Sep 12, 2019		Soil	B19-Se25026	X		
5	BH014 - 1.00-1.25M	Sep 12, 2019		Soil	B19-Se25027	X		
6	BH014 - 1.25-	Sep 12, 2019		Soil	B19-Se25028	X		

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Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	5 Day
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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
7	BH014 - 1.5-1.75M	Sep 12, 2019		Soil	B19-Se25029	X	X	X
8	BH014 - 1.75-2.0M	Sep 12, 2019		Soil	B19-Se25030	X		
9	BH014 - 2.00-2.25M	Sep 12, 2019		Soil	B19-Se25031	X		
10	BH014 - 2.25-2.5M	Sep 12, 2019		Soil	B19-Se25032	X		
11	BH014 - 2.5-2.75M	Sep 12, 2019		Soil	B19-Se25033	X		
12	BH014 - 2.75-3.00M	Sep 12, 2019		Soil	B19-Se25034	X		
13	BH014 - 3.00-	Sep 12, 2019		Soil	B19-Se25035	X	X	X

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Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	5 Day
Project ID:	19210	Fax:		Contact Name:	- ALL INV & STATEMENTS

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	3.25M							
14	BH014 - 3.25-3.5M	Sep 12, 2019		Soil	B19-Se25036	X		
15	BH015 - 0.0-0.25M	Sep 12, 2019		Soil	B19-Se25037	X	X	X
16	BH015 - 0.25-0.5M	Sep 12, 2019		Soil	B19-Se25038	X		
17	BH015 - 0.5-0.75M	Sep 12, 2019		Soil	B19-Se25039	X		
18	BH015 - 0.75-1.00M	Sep 12, 2019		Soil	B19-Se25040	X	X	X
19	BH015 - 1.00-1.25M	Sep 12, 2019		Soil	B19-Se25041	X		
20	BH015 - 1.25-	Sep 12, 2019		Soil	B19-Se25042	X		

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Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	5 Day
Project ID:	19210	Fax:		Contact Name:	- ALL INV & STATEMENTS

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
21	BH015 - 1.5-1.75M	Sep 12, 2019		Soil	B19-Se25043	X		
22	BH015 - 1.75-2.00M	Sep 12, 2019		Soil	B19-Se25044	X		
23	BH015 - 2.00-2.25M	Sep 12, 2019		Soil	B19-Se25045	X	X	X
24	BH015 - 2.25-2.5M	Sep 12, 2019		Soil	B19-Se25046	X		
25	BH015 - 2.5-2.75M	Sep 12, 2019		Soil	B19-Se25047	X		
26	BH015 - 2.75-3.00M	Sep 12, 2019		Soil	B19-Se25048	X		
27	BH015 - 3.00-	Sep 12, 2019		Soil	B19-Se25049	X	X	X

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Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	5 Day
Project ID:	19210	Fax:		Contact Name:	- ALL INV & STATEMENTS

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	3.25M							
28	BH015 - 3.25-3.5M	Sep 12, 2019		Soil	B19-Se25050	X		
29	BH016 - 0.0-0.25M	Sep 12, 2019		Soil	B19-Se25051	X		
30	BH016 - 0.25-0.5M	Sep 12, 2019		Soil	B19-Se25052	X		
31	BH016 - 0.5-0.75M	Sep 12, 2019		Soil	B19-Se25053	X	X	X
32	BH016 - 0.75-1.00M	Sep 12, 2019		Soil	B19-Se25054	X		
33	BH016 - 1.00-1.25M	Sep 12, 2019		Soil	B19-Se25055	X		
34	BH016 - 1.25-	Sep 12, 2019		Soil	B19-Se25056	X		

Company Name: Tectonic Geotechnical Pty Ltd	Order No.:	Received: Sep 16, 2019 9:00 AM
Address: 40A Glen Vista Place Chevalum Qld 4555	Report #: 677358	Due: Sep 23, 2019
Project Name: MIBA - NORTH HARBOUR	Phone: 07 5478 9642	Priority: 5 Day
Project ID: 19210	Fax:	Contact Name: - ALL INV & STATEMENTS

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
35	BH016 - 1.5-1.75M	Sep 12, 2019		Soil	B19-Se25057	X		
36	BH016 - 1.75-2.00M	Sep 12, 2019		Soil	B19-Se25058	X	X	X
37	BH016 - 2.00-2.25M	Sep 12, 2019		Soil	B19-Se25059	X		
38	BH016 - 2.25-2.5M	Sep 12, 2019		Soil	B19-Se25060	X		
39	BH016 - 2.5-2.75M	Sep 12, 2019		Soil	B19-Se25061	X	X	X
40	BH016 - 2.75-3.00M	Sep 12, 2019		Soil	B19-Se25062	X		
41	BH016 - 3.00-	Sep 12, 2019		Soil	B19-Se25063	X		

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 16, 2019 9:00 AM
Address:	40A Glen Vista Place Chevalum Qld 4555	Report #:	677358	Due:	Sep 23, 2019
Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	5 Day
Project ID:	19210	Fax:		Contact Name:	- ALL INV & STATEMENTS

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	3.25M							
42	BH016 - 3.25-3.5M	Sep 12, 2019		Soil	B19-Se25064	X		
43	BH017 - 0.0-0.25M	Sep 12, 2019		Soil	B19-Se25065	X	X	X
44	BH017 - 0.25-0.5M	Sep 12, 2019		Soil	B19-Se25066	X		
45	BH017 - 0.5-0.75M	Sep 12, 2019		Soil	B19-Se25067	X		
46	BH017 - 0.75-1.00M	Sep 12, 2019		Soil	B19-Se25068	X		
47	BH017 - 1.00-1.25M	Sep 12, 2019		Soil	B19-Se25069	X	X	X
48	BH017 - 1.25-	Sep 12, 2019		Soil	B19-Se25070	X		

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Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	5 Day
Project ID:	19210	Fax:		Contact Name:	- ALL INV & STATEMENTS

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
49	BH017 - 1.5-1.75M	Sep 12, 2019		Soil	B19-Se25071	X		
50	BH017 - 1.75-2.00M	Sep 12, 2019		Soil	B19-Se25072	X		
51	BH017 - 2.00-2.25M	Sep 12, 2019		Soil	B19-Se25073	X		
52	BH017 - 2.25-2.5M	Sep 12, 2019		Soil	B19-Se25074	X	X	X
53	BH017 - 2.5-2.75M	Sep 12, 2019		Soil	B19-Se25075	X		
54	BH017 - 2.75-3.00M	Sep 12, 2019		Soil	B19-Se25076	X		
55	BH017 - 3.00-	Sep 12, 2019		Soil	B19-Se25077	X		

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Project ID:	19210	Fax:		Contact Name:	- ALL INV & STATEMENTS

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	3.25M							
56	BH017 - 3.25-3.5M	Sep 12, 2019		Soil	B19-Se25078	X	X	X
57	BH019 - 0.00-0.25M	Sep 12, 2019		Soil	B19-Se25079	X		
58	BH019 - 0.25-0.5M	Sep 12, 2019		Soil	B19-Se25080	X	X	X
59	BH019 - 0.5-0.75M	Sep 12, 2019		Soil	B19-Se25081	X		
60	BH019 - 0.75-1.00M	Sep 12, 2019		Soil	B19-Se25082	X		
61	BH019 - 1.00-1.25M	Sep 12, 2019		Soil	B19-Se25083	X	X	X
62	BH019 - 1.25-	Sep 12, 2019		Soil	B19-Se25084	X		

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Project ID:	19210	Fax:		Contact Name:	- ALL INV & STATEMENTS

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
63	BH019 - 1.5-1.75M	Sep 12, 2019		Soil	B19-Se25085	X		
64	BH019 - 1.75-2.00M	Sep 12, 2019		Soil	B19-Se25086	X		
65	BH019 - 2.00-2.25M	Sep 12, 2019		Soil	B19-Se25087	X		
66	BH019 - 2.25-2.5M	Sep 12, 2019		Soil	B19-Se25088	X	X	X
67	BH019 - 2.5-2.75M	Sep 12, 2019		Soil	B19-Se25089	X		
68	BH019 - 2.75-3.00M	Sep 12, 2019		Soil	B19-Se25090	X		
69	BH019 - 3.00-	Sep 12, 2019		Soil	B19-Se25091	X	X	X

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Project ID:	19210	Fax:		Contact Name:	- ALL INV & STATEMENTS

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	3.25M							
70	BH019 - 3.25-3.5M	Sep 12, 2019		Soil	B19-Se25092	X		
71	BH020 - 0.0-0.25M	Sep 12, 2019		Soil	B19-Se25093	X		
72	BH020 - 0.25-0.5M	Sep 12, 2019		Soil	B19-Se25094	X		
73	BH020 - 0.5-0.75M	Sep 12, 2019		Soil	B19-Se25095	X	X	X
74	BH020 - 0.75-1.00M	Sep 12, 2019		Soil	B19-Se25096	X		
75	BH020 - 1.00-1.25M	Sep 12, 2019		Soil	B19-Se25097	X		
76	BH020 - 1.25-	Sep 12, 2019		Soil	B19-Se25098	X		

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Project ID:	19210	Fax:		Contact Name:	- ALL INV & STATEMENTS

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
77	BH020 - 1.5-1.75M	Sep 12, 2019		Soil	B19-Se25099	X	X	X
78	BH020 - 1.75-2.00M	Sep 12, 2019		Soil	B19-Se25100	X		
79	BH020 - 2.00-2.25M	Sep 12, 2019		Soil	B19-Se25101	X		
80	BH020 - 2.25-2.5M	Sep 12, 2019		Soil	B19-Se25102	X		
81	BH020 - 2.5-2.75M	Sep 12, 2019		Soil	B19-Se25103	X	X	X
82	BH020 - 2.75-3.00M	Sep 12, 2019		Soil	B19-Se25104	X		
83	BH020 - 3.00-	Sep 12, 2019		Soil	B19-Se25105	X		

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Project ID:	19210	Fax:		Contact Name:	- ALL INV & STATEMENTS

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	3.25M							
84	BH020 - 3.25-3.5M	Sep 12, 2019		Soil	B19-Se25106	X	X	X
Test Counts						84	22	22

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.
- 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.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- 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

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

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

QC Data General Comments

- 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.
- 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.
- Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
- 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.
- 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.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
- For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery										
Chromium Suite (SKCI)										
Chromium Reducible Sulfur				%	101			70-130	Pass	
Acid Neutralising Capacity (ANCbt)				%	91			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1				Acceptance Limits	Pass Limits	Qualifying Code
Duplicate										
Chromium Suite (SKCI)										
				Result 1	Result 2	RPD				
pH-KCL	B19-Se25024	CP	pH Units	4.5	4.5	<1		30%	Pass	
Acid trail - Titratable Actual Acidity	B19-Se25024	CP	mol H+/t	39	40	<1		30%	Pass	
sulfidic - TAA equiv. S% pyrite	B19-Se25024	CP	% pyrite S	0.060	0.060	1.0		30%	Pass	
Chromium Reducible Sulfur	B19-Se25024	CP	% S	< 0.005	< 0.005	<1		30%	Pass	
Chromium Reducible Sulfur -acidity units	B19-Se25024	CP	mol H+/t	< 3	< 3	<1		30%	Pass	
Sulfur - KCl Extractable	B19-Se25024	CP	% S	< 0.02	< 0.02	<1		30%	Pass	
Net Acid soluble sulfur	B19-Se25024	CP	% S	< 0.02	< 0.02	<1		30%	Pass	
Net Acid soluble sulfur - acidity units	B19-Se25024	CP	mol H+/t	< 10	< 10	<1		30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	B19-Se25024	CP	% S	< 0.02	< 0.02	<1		30%	Pass	
Acid Neutralising Capacity (ANCbt)	B19-Se25024	CP	% CaCO3	n/a	n/a	n/a		30%	Pass	
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	B19-Se25024	CP	% S	n/a	n/a	n/a		30%	Pass	
ANC Fineness Factor	B19-Se25024	CP	factor	1.5	1.5	<1		30%	Pass	
CRS Suite - Net Acidity (Sulfur Units)	B19-Se25024	CP	% S	0.06	0.06	n/a		30%	Pass	
CRS Suite - Net Acidity (Acidity Units)	B19-Se25024	CP	mol H+/t	39	40	n/a		30%	Pass	
CRS Suite - Liming Rate	B19-Se25024	CP	kg CaCO3/t	2.9	3.0	1.0		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test										
				Result 1	Result 2	RPD				
pH-F (Field pH test)*	B19-Se25029	CP	pH Units	7.8	7.8	pass		30%	Pass	
Reaction Ratings*	B19-Se25029	CP	comment	4.0	4.0	pass		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test										
				Result 1	Result 2	RPD				
pH-F (Field pH test)*	B19-Se25039	CP	pH Units	6.3	6.4	pass		30%	Pass	
Reaction Ratings*	B19-Se25039	CP	comment	3.0	3.0	pass		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test										
				Result 1	Result 2	RPD				
pH-F (Field pH test)*	B19-Se25049	CP	pH Units	8.1	8.1	pass		30%	Pass	
Reaction Ratings*	B19-Se25049	CP	comment	4.0	4.0	pass		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test										
				Result 1	Result 2	RPD				
pH-F (Field pH test)*	B19-Se25059	CP	pH Units	8.1	8.0	pass		30%	Pass	
Reaction Ratings*	B19-Se25059	CP	comment	4.0	4.0	pass		30%	Pass	
Duplicate										
				Result 1	Result 2	RPD				
% Moisture	B19-Se25061	CP	%	28	35	21		30%	Pass	
Duplicate										
Chromium Suite (SKCI)										
				Result 1	Result 2	RPD				
pH-KCL	B19-Se25065	CP	pH Units	5.0	5.0	<1		30%	Pass	
Acid trail - Titratable Actual Acidity	B19-Se25065	CP	mol H+/t	22	23	4.2		30%	Pass	
sulfidic - TAA equiv. S% pyrite	B19-Se25065	CP	% pyrite S	0.030	0.040	4.0		30%	Pass	
Chromium Reducible Sulfur	B19-Se25065	CP	% S	< 0.005	< 0.005	<1		30%	Pass	

Duplicate								
Chromium Suite (SKCI)				Result 1	Result 2	RPD		
Chromium Reducible Sulfur -acidity units	B19-Se25065	CP	mol H+/t	< 3	< 3	<1	30%	Pass
Sulfur - KCl Extractable	B19-Se25065	CP	% S	< 0.02	< 0.02	<1	30%	Pass
Net Acid soluble sulfur	B19-Se25065	CP	% S	n/a	n/a	n/a	30%	Pass
Net Acid soluble sulfur - acidity units	B19-Se25065	CP	mol H+/t	n/a	n/a	n/a	30%	Pass
Net Acid soluble sulfur - equivalent S% pyrite	B19-Se25065	CP	% S	n/a	n/a	n/a	30%	Pass
Acid Neutralising Capacity (ANCbt)	B19-Se25065	CP	% CaCO3	n/a	n/a	n/a	30%	Pass
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	B19-Se25065	CP	% S	n/a	n/a	n/a	30%	Pass
ANC Fineness Factor	B19-Se25065	CP	factor	1.5	1.5	<1	30%	Pass
CRS Suite - Net Acidity (Sulfur Units)	B19-Se25065	CP	% S	0.03	0.04	n/a	30%	Pass
CRS Suite - Net Acidity (Acidity Units)	B19-Se25065	CP	mol H+/t	22	23	n/a	30%	Pass
CRS Suite - Liming Rate	B19-Se25065	CP	kg CaCO3/t	1.6	1.7	4.0	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se25069	CP	pH Units	7.1	7.1	pass	30%	Pass
Reaction Ratings*	B19-Se25069	CP	comment	4.0	4.0	pass	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se25079	CP	pH Units	5.8	5.9	pass	30%	Pass
Reaction Ratings*	B19-Se25079	CP	comment	3.0	3.0	pass	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se25089	CP	pH Units	7.6	7.5	pass	30%	Pass
Reaction Ratings*	B19-Se25089	CP	comment	4.0	4.0	pass	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se25099	CP	pH Units	7.3	7.3	pass	30%	Pass
Reaction Ratings*	B19-Se25099	CP	comment	4.0	4.0	pass	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	B19-Se25099	CP	%	35	37	5.0	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	No

Qualifier Codes/Comments

Code	Description
S01	Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO ₃) 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/m ³ in-situ soil' multiply 'reported results' x 'wet bulk density of soil in t/m ³ '
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5
S03	Acid Neutralising Capacity is only required if the pHKCl is 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
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised By

Ryan Gilbert	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](#).

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 Accreditation Number 1261
 Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: **Mark Thomson**

Report **678140-S**
 Project name **MIBA - NORTH HARBOUR**
 Project ID **19210**
 Received Date **Sep 19, 2019**

Client Sample ID			BH027 - 0.0-0.25M	BH027 - 0.25-0.5M	BH027 - 0.5-0.75M	BH027 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31312	B19-Se31313	B19-Se31314	B19-Se31315
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.0	5.0	5.3	4.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.7	3.5	3.0	3.6
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.2	-	4.2	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	98	-	97	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.16	-	0.16	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	< 0.005	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	< 3	-
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	2.0	-
HCl Extractable Sulfur	0.02	% S	0.04	-	0.02	-
Net Acid soluble sulfur	0.02	% S	0.04	-	< 0.02	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	17	-	< 10	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	0.03	-	< 0.02	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	n/a	-	n/a	-
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	n/a	-	n/a	-
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	n/a	-
ANC Fineness Factor		factor	1.5	-	1.5	-
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	0.18	-	0.16	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	110	-	110	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	8.6	-	7.9	-
<2mm Fraction	0.005	g	59	-	57	-
>2mm Fraction	0.005	g	< 0.005	-	25	-
Analysed Material	0.1	%	100	-	70	-
Extraneous Material	0.1	%	< 0.1	-	30	-
% Moisture	1	%	17	-	21	-

Client Sample ID			BH027 - 1.00-1.25M	BH027 - 1.25-1.5M	BH027 - 1.5-1.75M	BH027 - 1.75-2.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31316	B19-Se31317	B19-Se31318	B19-Se31319
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.7	4.7	4.6	4.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.7	3.4	3.6	3.4
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0

Client Sample ID			BH027 - 2.0-2.25M	BH027 - 2.25-2.5M	BH027 - 2.5-2.75M	BH027 - 2.75-3.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31320	B19-Se31321	B19-Se31322	B19-Se31323
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.8	4.9	5.0	4.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.8	4.0	4.0	3.7
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.0	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	15	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.020	-	-	-
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	0.04	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-
HCl Extractable Sulfur	0.02	% S	0.08	-	-	-
Net Acid soluble sulfur	0.02	% S	0.04	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	21	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	0.03	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	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 CaCO ₃ /t	2.7	-	-	-
<2mm Fraction	0.005	g	160	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture						
	1	%	25	-	-	-

Client Sample ID			BH028 - 0.0-0.25M	BH028 - 0.25-0.5M	BH028 - 0.5-0.75M	BH028 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31324	B19-Se31325	B19-Se31326	B19-Se31327
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.2	5.3	4.9	5.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.7	3.3	3.2	3.5
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	4.2
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	71
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.11
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	0.02
Net Acid soluble sulfur	0.02	% S	-	-	-	< 0.02
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	< 10
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	< 0.02
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	-	-	-	0.11
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	79
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	5.9
<2mm Fraction	0.005	g	-	-	-	77
>2mm Fraction	0.005	g	-	-	-	24
Analysed Material	0.1	%	-	-	-	77
Extraneous Material	0.1	%	-	-	-	23
% Moisture	1	%	-	-	-	14

Client Sample ID			BH028 - 1.00-1.25M	BH028 - 1.25-1.5M	BH028 - 1.5-1.75M	BH028 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31328	B19-Se31329	B19-Se31330	B19-Se31331
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.7	4.7	4.8	5.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.7	3.7	3.8	3.7
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	3.9	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	11	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.020	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-

Client Sample ID			BH028 - 1.00-1.25M	BH028 - 1.25-1.5M	BH028 - 1.5-1.75M	BH028 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31328	B19-Se31329	B19-Se31330	B19-Se31331
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	-	0.02	-
Net Acid soluble sulfur	0.02	% S	-	-	0.02	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	11	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	< 0.02	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	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	-	-	0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	22	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	1.7	-
<2mm Fraction	0.005	g	-	-	130	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture	1	%	-	-	21	-

Client Sample ID			BH028 - 2.0-2.25M	BH028 - 2.25-2.5M	BH028 - 2.5-2.75M	BH028 - 2.75-3.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31332	B19-Se31333	B19-Se31334	B19-Se31335
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.7	5.0	5.1	5.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.6	4.1	4.5	4.5
Reaction Ratings ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	4.4
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	29
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.050
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	0.03
Net Acid soluble sulfur	0.02	% S	-	-	-	0.03
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	15
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	0.02
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	-	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	-	-	-	0.07
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	43

Client Sample ID			BH028 - 2.0-2.25M	BH028 - 2.25-2.5M	BH028 - 2.5-2.75M	BH028 - 2.75-3.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31332	B19-Se31333	B19-Se31334	B19-Se31335
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	3.3
<2mm Fraction	0.005	g	-	-	-	110
>2mm Fraction	0.005	g	-	-	-	56
Analysed Material	0.1	%	-	-	-	66
Extraneous Material	0.1	%	-	-	-	34
% Moisture	1	%	-	-	-	19

Client Sample ID			BH029 - 0.0-0.25M	BH029 - 0.25-0.5M	BH029 - 0.5-0.75M	BH029 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31336	B19-Se31337	B19-Se31338	B19-Se31339
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.2	5.1	4.7	4.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.1	3.8	3.7	3.6
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.3	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	110	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.18	-	-
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	-	0.03	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	0.06	-	-
Net Acid soluble sulfur	0.02	% S	-	0.03	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	13	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	0.02	-	-
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	-	0.20	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	120	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	9.3	-	-
<2mm Fraction	0.005	g	-	33	-	-
>2mm Fraction	0.005	g	-	6.5	-	-
Analysed Material	0.1	%	-	84	-	-
Extraneous Material	0.1	%	-	16	-	-
% Moisture	1	%	-	25	-	-

Client Sample ID			BH029 - 1.00-1.25M	BH029 - 1.25-1.5M	BH029 - 1.5-1.75M	BH029 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31340	B19-Se31341	B19-Se31342	B19-Se31343
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.7	4.7	4.8	5.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.6	4.0	3.8	4.4
Reaction Ratings* ^{S05}		comment	4.0	1.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.1	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	52	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.080	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	0.05	-	-
Net Acid soluble sulfur	0.02	% S	-	0.05	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	22	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	0.04	-	-
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	-	0.12	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	74	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	5.6	-	-
<2mm Fraction	0.005	g	-	69	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	25	-	-

Client Sample ID			BH029 - 2.0-2.25M	BH029 - 2.25-2.5M	BH029 - 2.5-2.75M	BH029 - 2.75-3.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31344	B19-Se31345	B19-Se31346	B19-Se31347
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.0	5.1	6.1	5.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.3	4.5	5.8	4.9
Reaction Ratings* ^{S05}		comment	4.0	1.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.4	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	24	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.040	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-

Client Sample ID			BH029 - 2.0-2.25M	BH029 - 2.25-2.5M	BH029 - 2.5-2.75M	BH029 - 2.75-3.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31344	B19-Se31345	B19-Se31346	B19-Se31347
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	0.03	-	-
Net Acid soluble sulfur	0.02	% S	-	0.03	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	13	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	0.02	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	37	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	2.7	-	-
<2mm Fraction	0.005	g	-	90	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	27	-	-

Client Sample ID			BH030 - 0.0-0.25M	BH030 - 0.25-0.5M	BH030 - 0.5-0.75M	BH030 - 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31348	B19-Se31349	B19-Se31350	B19-Se31351
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.1	4.9	4.4	4.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.2	3.5	3.9	3.5
Reaction Ratings ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	4.0
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	24
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.040
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	0.03
Net Acid soluble sulfur	0.02	% S	-	-	-	0.03
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	15
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	0.02
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	-	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	-	-	-	39

Client Sample ID			BH030 - 0.0-0.25M	BH030 - 0.25-0.5M	BH030 - 0.5-0.75M	BH030 - 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31348	B19-Se31349	B19-Se31350	B19-Se31351
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	2.9
<2mm Fraction	0.005	g	-	-	-	57
>2mm Fraction	0.005	g	-	-	-	29
Analysed Material	0.1	%	-	-	-	66
Extraneous Material	0.1	%	-	-	-	34
% Moisture	1	%	-	-	-	29

Client Sample ID			BH030 - 1.0-1.25M	BH030 - 1.25-1.5M	BH030 - 1.5-1.75M	BH030 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31352	B19-Se31353	B19-Se31354	B19-Se31355
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.5	4.5	4.5	4.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.5	3.6	3.3	3.2
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	3.9	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	23	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.040	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	0.03	-	-
Net Acid soluble sulfur	0.02	% S	-	0.03	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	15	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	0.02	-	-
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	-	39	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	2.9	-	-
<2mm Fraction	0.005	g	-	72	-	-
>2mm Fraction	0.005	g	-	1.3	-	-
Analysed Material	0.1	%	-	98	-	-
Extraneous Material	0.1	%	-	1.8	-	-
% Moisture	1	%	-	27	-	-

Client Sample ID			BH030 - 2.0-2.25M	BH030 - 2.25-2.5M	BH030 - 2.5-2.75M	BH030 - 2.75-3.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31356	B19-Se31357	B19-Se31358	B19-Se31359
Date Sampled			Sep 12, 2019	Sep 12, 2019	Sep 12, 2019	Sep 12, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.7	4.6	4.5	4.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.7	3.9	3.7	3.7
Reaction Ratings* ^{S05}		comment	1.0	2.0	1.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.1	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	91	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.15	-	-
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	-	0.03	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	0.05	-	-
Net Acid soluble sulfur	0.02	% S	-	0.03	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	13	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	0.02	-	-
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	-	0.17	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	100	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	7.8	-	-
<2mm Fraction	0.005	g	-	48	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	25	-	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

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 - Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests	Brisbane	Sep 20, 2019	7 Days
Chromium Suite (SKCI) - Method: LTM-GEN-7070	Brisbane	Sep 24, 2019	6 Week
% Moisture - Method: LTM-GEN-7080 Moisture	Brisbane	Sep 20, 2019	14 Days

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 19, 2019 9:00 AM
Address:	40A Glen Vista Place Chevalum Qld 4555	Report #:	678140	Due:	Sep 26, 2019
Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	5 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	BH027 - 0.0-0.25M	Sep 12, 2019		Soil	B19-Se31312	X	X	X
2	BH027 - 0.25-0.5M	Sep 12, 2019		Soil	B19-Se31313	X		
3	BH027 - 0.5-0.75M	Sep 12, 2019		Soil	B19-Se31314	X	X	X
4	BH027 - 0.75-1.00M	Sep 12, 2019		Soil	B19-Se31315	X		
5	BH027 - 1.00-1.25M	Sep 12, 2019		Soil	B19-Se31316	X		
6	BH027 - 1.25-	Sep 12, 2019		Soil	B19-Se31317	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
7	BH027 - 1.5-1.75M	Sep 12, 2019		Soil	B19-Se31318	X		
8	BH027 - 1.75-2.00M	Sep 12, 2019		Soil	B19-Se31319	X		
9	BH027 - 2.0-2.25M	Sep 12, 2019		Soil	B19-Se31320	X	X	X
10	BH027 - 2.25-2.5M	Sep 12, 2019		Soil	B19-Se31321	X		
11	BH027 - 2.5-2.75M	Sep 12, 2019		Soil	B19-Se31322	X		
12	BH027 - 2.75-3.0M	Sep 12, 2019		Soil	B19-Se31323	X		
13	BH028 - 0.0-	Sep 12, 2019		Soil	B19-Se31324	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	0.25M							
14	BH028 - 0.25-0.5M	Sep 12, 2019		Soil	B19-Se31325	X		
15	BH028 - 0.5-0.75M	Sep 12, 2019		Soil	B19-Se31326	X		
16	BH028 - 0.75-1.00M	Sep 12, 2019		Soil	B19-Se31327	X	X	X
17	BH028 - 1.00-1.25M	Sep 12, 2019		Soil	B19-Se31328	X		
18	BH028 - 1.25-1.5M	Sep 12, 2019		Soil	B19-Se31329	X		
19	BH028 - 1.5-1.75M	Sep 12, 2019		Soil	B19-Se31330	X	X	X
20	BH028 - 1.75-	Sep 12, 2019		Soil	B19-Se31331	X		

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Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	5 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	2.0M							
21	BH028 - 2.0-2.25M	Sep 12, 2019		Soil	B19-Se31332	X		
22	BH028 - 2.25-2.5M	Sep 12, 2019		Soil	B19-Se31333	X		
23	BH028 - 2.5-2.75M	Sep 12, 2019		Soil	B19-Se31334	X		
24	BH028 - 2.75-3.0M	Sep 12, 2019		Soil	B19-Se31335	X	X	X
25	BH029 - 0.0-0.25M	Sep 12, 2019		Soil	B19-Se31336	X		
26	BH029 - 0.25-0.5M	Sep 12, 2019		Soil	B19-Se31337	X	X	X
27	BH029 - 0.5-	Sep 12, 2019		Soil	B19-Se31338	X		

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Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	5 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	0.75M							
28	BH029 - 0.75-1.00M	Sep 12, 2019		Soil	B19-Se31339	X		
29	BH029 - 1.00-1.25M	Sep 12, 2019		Soil	B19-Se31340	X		
30	BH029 - 1.25-1.5M	Sep 12, 2019		Soil	B19-Se31341	X	X	X
31	BH029 - 1.5-1.75M	Sep 12, 2019		Soil	B19-Se31342	X		
32	BH029 - 1.75-2.0M	Sep 12, 2019		Soil	B19-Se31343	X		
33	BH029 - 2.0-2.25M	Sep 12, 2019		Soil	B19-Se31344	X		
34	BH029 - 2.25-	Sep 12, 2019		Soil	B19-Se31345	X	X	X

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 19, 2019 9:00 AM
Address:	40A Glen Vista Place Chevalum Qld 4555	Report #:	678140	Due:	Sep 26, 2019
Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	5 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	2.5M							
35	BH029 - 2.5-2.75M	Sep 12, 2019		Soil	B19-Se31346	X		
36	BH029 - 2.75-3.0M	Sep 12, 2019		Soil	B19-Se31347	X		
37	BH030 - 0.0-0.25M	Sep 12, 2019		Soil	B19-Se31348	X		
38	BH030 - 0.25-0.5M	Sep 12, 2019		Soil	B19-Se31349	X		
39	BH030 - 0.5-0.75M	Sep 12, 2019		Soil	B19-Se31350	X		
40	BH030 - 0.75-1.0M	Sep 12, 2019		Soil	B19-Se31351	X	X	X
41	BH030 - 1.0-	Sep 12, 2019		Soil	B19-Se31352	X		

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 19, 2019 9:00 AM
Address:	40A Glen Vista Place Chevalum Qld 4555	Report #:	678140	Due:	Sep 26, 2019
Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	5 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.25M							
42	BH030 - 1.25-1.5M	Sep 12, 2019		Soil	B19-Se31353	X	X	X
43	BH030 - 1.5-1.75M	Sep 12, 2019		Soil	B19-Se31354	X		
44	BH030 - 1.75-2.0M	Sep 12, 2019		Soil	B19-Se31355	X		
45	BH030 - 2.0-2.25M	Sep 12, 2019		Soil	B19-Se31356	X		
46	BH030 - 2.25-2.5M	Sep 12, 2019		Soil	B19-Se31357	X	X	X
47	BH030 - 2.5-2.75M	Sep 12, 2019		Soil	B19-Se31358	X		
48	BH030 - 2.75-	Sep 12, 2019		Soil	B19-Se31359	X		

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 19, 2019 9:00 AM
Address:	40A Glen Vista Place Chevalum Qld 4555	Report #:	678140	Due:	Sep 26, 2019
Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	5 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail					Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794					X	X	X
Perth Laboratory - NATA Site # 23736							
	3.0M						
Test Counts					48	12	12

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery										
Chromium Suite (SKCI)										
Chromium Reducible Sulfur				%	98			70-130	Pass	
Acid Neutralising Capacity (ANCbt)				%	95			70-130	Pass	
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)*	B19-Se31312	CP	pH Units	5.0	5.0	pass		30%	Pass	
Reaction Ratings*	B19-Se31312	CP	comment	4.0	4.0	pass		30%	Pass	
Duplicate										
Chromium Suite (SKCI)					Result 1	Result 2	RPD			
pH-KCL	M19-Se29049	NCP	pH Units	9.4	9.4	<1		30%	Pass	
Acid trail - Titratable Actual Acidity	M19-Se29049	NCP	mol H+/t	< 2	< 2	<1		30%	Pass	
sulfidic - TAA equiv. S% pyrite	M19-Se29049	NCP	% pyrite S	< 0.003	< 0.003	<1		30%	Pass	
Chromium Reducible Sulfur	M19-Se29049	NCP	% S	0.019	0.018	6.0		30%	Pass	
Chromium Reducible Sulfur -acidity units	M19-Se29049	NCP	mol H+/t	12	11	6.0		30%	Pass	
Sulfur - KCl Extractable	M19-Se29049	NCP	% S	n/a	n/a	n/a		30%	Pass	
Net Acid soluble sulfur	M19-Se29049	NCP	% S	n/a	n/a	n/a		30%	Pass	
Net Acid soluble sulfur - acidity units	M19-Se29049	NCP	mol H+/t	n/a	n/a	n/a		30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	M19-Se29049	NCP	% S	n/a	n/a	n/a		30%	Pass	
Acid Neutralising Capacity (ANCbt)	M19-Se29049	NCP	% CaCO3	42	42	<1		30%	Pass	
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	M19-Se29049	NCP	% S	13	13	<1		30%	Pass	
ANC Fineness Factor	M19-Se29049	NCP	factor	1.5	1.5	<1		30%	Pass	
CRS Suite - Net Acidity (Sulfur Units)	M19-Se29049	NCP	% S	< 0.02	< 0.02	<1		30%	Pass	
CRS Suite - Net Acidity (Acidity Units)	M19-Se29049	NCP	mol H+/t	< 10	< 10	<1		30%	Pass	
CRS Suite - Liming Rate	M19-Se29049	NCP	kg CaCO3/t	< 1	< 1	<1		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test					Result 1	Result 2	RPD			
pH-F (Field pH test)*	B19-Se31322	CP	pH Units	5.0	4.9	pass		30%	Pass	
Reaction Ratings*	B19-Se31322	CP	comment	4.0	4.0	pass		30%	Pass	
Duplicate										
					Result 1	Result 2	RPD			
% Moisture	B19-Se31327	CP	%	14	14	2.0		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test					Result 1	Result 2	RPD			
pH-F (Field pH test)*	B19-Se31332	CP	pH Units	4.7	4.9	pass		30%	Pass	
Reaction Ratings*	B19-Se31332	CP	comment	4.0	4.0	pass		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test					Result 1	Result 2	RPD			
pH-F (Field pH test)*	B19-Se31336	CP	pH Units	5.2	5.2	pass		30%	Pass	
Reaction Ratings*	B19-Se31336	CP	comment	4.0	4.0	pass		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test					Result 1	Result 2	RPD			
pH-F (Field pH test)*	B19-Se31346	CP	pH Units	6.1	6.0	pass		30%	Pass	
Reaction Ratings*	B19-Se31346	CP	comment	4.0	4.0	pass		30%	Pass	

Comments
Sample Integrity

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

Qualifier Codes/Comments

Code	Description
S01	Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO ₃) 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/m ³ in-situ soil' multiply 'reported results' x 'wet bulk density of soil in t/m ³ '
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5
S03	Acid Neutralising Capacity is only required if the pHKCl is 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
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised By

Ryan Gilbert	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](#).

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Tectonic Geotechnical Pty Ltd
 40A Glen Vista Place
 Chevalum
 Qld 4555



NATA Accredited
 Accreditation Number 1261
 Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: **Mark Thomson**

Report **678154-S**
 Project name **MIBA - NORTH HARBOUR**
 Project ID **19210**
 Received Date **Sep 19, 2019**

Client Sample ID			BH031 - 0.0-0.25M	BH031 - 0.25-0.5M	BH031 - 0.5-0.75M	BH031 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31510	B19-Se31511	B19-Se31512	B19-Se31513
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.4	5.6	5.3	5.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.5	3.4	3.8	3.7
Reaction Ratings* ^{S05}		comment	4.0	4.0	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.2	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	170	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.27	-	-	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	0.036	-	-	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	22	-	-	-
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-
HCl Extractable Sulfur	0.02	% S	0.03	-	-	-
Net Acid soluble sulfur	0.02	% S	0.03	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	13	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	0.02	-	-	-
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	0.32	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	200	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	15	-	-	-
<2mm Fraction	0.005	g	86	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture	1	%	35	-	-	-

Client Sample ID			BH031 - 1.00-1.25M	BH031 - 1.25-1.5M	BH031 - 1.5-1.75M	BH031 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31514	B19-Se31515	B19-Se31516	B19-Se31517
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.3	5.2	5.2	5.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.6	3.7	4.0	4.2
Reaction Ratings**S05		comment	2.0	2.0	2.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.1	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	88	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.14	-	-	-
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	0.04	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-
HCl Extractable Sulfur	0.02	% S	0.02	-	-	-
Net Acid soluble sulfur	0.02	% S	< 0.02	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	< 10	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	< 0.02	-	-	-
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	0.14	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	88	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	6.6	-	-	-
<2mm Fraction	0.005	g	55	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture	1	%	28	-	-	-

Client Sample ID			BH031 - 2.0-2.25M	BH031 - 2.25-2.5M	BH031 - 2.5-2.75M	BH031 - 2.75-3.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31518	B19-Se31519	B19-Se31520	B19-Se31521
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.2	5.3	5.5	5.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.1	4.3	4.6	4.8
Reaction Ratings**S05		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.1	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	80	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.13	-	-	-
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	< 0.02	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-

Client Sample ID			BH031 - 2.0-2.25M	BH031 - 2.25-2.5M	BH031 - 2.5-2.75M	BH031 - 2.75-3.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31518	B19-Se31519	B19-Se31520	B19-Se31521
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	0.05	-	-	-
Net Acid soluble sulfur	0.02	% S	0.05	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	23	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	0.04	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	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	0.17	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	100	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	7.7	-	-	-
<2mm Fraction	0.005	g	55	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture	1	%	22	-	-	-

Client Sample ID			BH032 - 0.0-0.25M	BH032 - 0.25-0.5M	BH032 - 0.5-0.75M	BH032 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31522	B19-Se31523	B19-Se31524	B19-Se31525
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.6	6.6	6.5	6.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.7	4.4	5.7	6.5
Reaction Ratings ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.7	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	25	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.040	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	0.04	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	25	-	-

Client Sample ID			BH032 - 0.0-0.25M	BH032 - 0.25-0.5M	BH032 - 0.5-0.75M	BH032 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31522	B19-Se31523	B19-Se31524	B19-Se31525
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	1.9	-	-
<2mm Fraction	0.005	g	-	95	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	1	%	-	14	-	-

Client Sample ID			BH032 - 1.00-1.25M	BH032 - 1.25-1.5M	BH032 - 1.5-1.75M	BH032 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31526	B19-Se31527	B19-Se31528	B19-Se31529
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.1	7.0	7.3	7.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	6.3	6.5	6.6	6.9
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	5.8	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	6.3	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.010	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	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	-	< 0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	< 1	-	-
<2mm Fraction	0.005	g	-	80	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	1	%	-	15	-	-

Client Sample ID			BH032 - 2.0-2.25M	BH032 - 2.25-2.5M	BH032 - 2.5-2.75M	BH032 - 2.75-3.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31530	B19-Se31531	B19-Se31532	B19-Se31533
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.5	7.5	7.4	7.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	6.7	8.3	8.2	8.3
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	5.8
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	4.3
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.010
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	-	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	-	-	-	< 0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	< 10
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	< 1
<2mm Fraction	0.005	g	-	-	-	91
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture	1	%	-	-	-	14

Client Sample ID			BH033 - 0.0-0.25M	BH033 - 0.25-0.5M	BH033 - 0.5-0.75M	BH033 - 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31534	B19-Se31535	B19-Se31536	B19-Se31537
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.8	5.8	6.1	6.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.6	4.7	4.7	4.6
Reaction Ratings* ^{S05}		comment	4.0	3.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	4.8
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	19
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.030
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0

Client Sample ID			BH033 - 0.0-0.25M	BH033 - 0.25-0.5M	BH033 - 0.5-0.75M	BH033 - 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31534	B19-Se31535	B19-Se31536	B19-Se31537
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	-	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	-	-	-	0.03
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	19
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	-	1.4
<2mm Fraction	0.005	g	-	-	-	89
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture	1	%	-	-	-	23

Client Sample ID			BH033 - 1.0-1.25M	BH033 - 1.25-1.5M	BH033 - 1.5-1.75M	BH033 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31538	B19-Se31539	B19-Se31540	B19-Se31541
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.6	5.4	5.2	5.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.5	4.4	4.3	4.3
Reaction Ratings ^{S05}		comment	2.0	2.0	2.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	5.0
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	13
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.020
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	-	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	-	-	-	0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	13

Client Sample ID			BH033 - 1.0-1.25M	BH033 - 1.25-1.5M	BH033 - 1.5-1.75M	BH033 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31538	B19-Se31539	B19-Se31540	B19-Se31541
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	< 1
<2mm Fraction	0.005	g	-	-	-	100
>2mm Fraction	0.005	g	-	-	-	5.1
Analysed Material	0.1	%	-	-	-	95
Extraneous Material	0.1	%	-	-	-	4.8
% Moisture						
	1	%	-	-	-	9.5

Client Sample ID			BH033 - 2.0-2.25M	BH033 - 2.25-2.5M	BH033 - 2.5-2.75M	BH033 - 2.75-3.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31542	B19-Se31543	B19-Se31544	B19-Se31545
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.1	5.1	5.2	5.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.3	4.4	4.8	4.6
Reaction Ratings* ^{S05}		comment	2.0	4.0	2.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	4.4	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	22	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.040	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	0.02	-
Net Acid soluble sulfur	0.02	% S	-	-	0.02	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	< 10	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	< 0.02	-
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	-	-	0.04	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	32	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	2.4	-
<2mm Fraction	0.005	g	-	-	92	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture						
	1	%	-	-	19	-

Client Sample ID			BH034 - 0.0-0.25M	BH034 - 0.25-0.5M	BH034 - 0.5-0.75M	BH034 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31546	B19-Se31547	B19-Se31548	B19-Se31549
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.0	6.4	7.1	7.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.3	4.6	5.9	7.3
Reaction Ratings**S05		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.8	4.8	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	33	32	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.050	0.050	-	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	< 0.005	-	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	< 3	-	-
Sulfur - KCl Extractable	0.02	% S	< 0.02	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	2.0	-	-
HCl Extractable Sulfur	0.02	% S	n/a	n/a	-	-
Net Acid soluble sulfur	0.02	% S	n/a	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	n/a	n/a	-	-
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	n/a	n/a	-	-
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	n/a	-	-
ANC Fineness Factor		factor	1.5	1.5	-	-
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	0.05	0.05	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	33	32	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	2.4	2.4	-	-
<2mm Fraction	0.005	g	76	53	-	-
>2mm Fraction	0.005	g	< 0.005	< 0.005	-	-
Analysed Material	0.1	%	100	100	-	-
Extraneous Material	0.1	%	< 0.1	< 0.1	-	-
% Moisture	1	%	13	17	-	-

Client Sample ID			BH034 - 1.00-1.25M	BH034 - 1.25-1.5M	BH034 - 1.5-1.75M	BH034 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31550	B19-Se31551	B19-Se31552	B19-Se31553
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.7	7.8	7.9	7.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	6.8	7.7	7.0	6.9
Reaction Ratings**S05		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	5.8	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	6.2	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.010	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-

Client Sample ID			BH034 - 1.00-1.25M	BH034 - 1.25-1.5M	BH034 - 1.5-1.75M	BH034 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31550	B19-Se31551	B19-Se31552	B19-Se31553
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	< 0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	< 1	-	-
<2mm Fraction	0.005	g	-	50	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	24	-	-

Client Sample ID			BH034 - 2.0-2.25M	BH034 - 2.25-2.5M	BH034 - 2.5-2.75M	BH034 - 2.75-3.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31554	B19-Se31555	B19-Se31556	B19-Se31557
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.9	8.0	7.9	8.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.1	7.8	8.2	7.9
Reaction Ratings ^{S05}		comment	4.0	4.0	4.0	4.0

Client Sample ID			BH035 - 0.0-0.25M	BH035 - 0.25-0.5M	BH035 - 0.5-0.75M	BH035 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31558	B19-Se31559	B19-Se31560	B19-Se31561
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.2	5.9	5.5	5.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.6	3.6	4.1	4.2
Reaction Ratings ^{S05}		comment	4.0	4.0	4.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.3	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	95	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.15	-	-	-
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	< 0.02	-	-	-

Client Sample ID			BH035 - 0.0-0.25M	BH035 - 0.25-0.5M	BH035 - 0.5-0.75M	BH035 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31558	B19-Se31559	B19-Se31560	B19-Se31561
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-
HCl Extractable Sulfur	0.02	% S	< 0.02	-	-	-
Net Acid soluble sulfur	0.02	% S	< 0.02	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	< 10	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	< 0.02	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	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	0.15	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	95	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	7.2	-	-	-
<2mm Fraction	0.005	g	39	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture						
	1	%	18	-	-	-

Client Sample ID			BH035 - 1.00-1.25M	BH035 - 1.25-1.5M	BH035 - 1.5-1.75M	BH035 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31562	B19-Se31563	B19-Se31564	B19-Se31565
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.5	5.5	5.9	5.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.8	4.5	4.7	4.8
Reaction Ratings ^{*S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.4	-	-
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	-	0.04	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	0.08	-	-
Net Acid soluble sulfur	0.02	% S	-	0.03	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	16	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	0.03	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	0.08	-	-

Client Sample ID			BH035 - 1.00-1.25M	BH035 - 1.25-1.5M	BH035 - 1.5-1.75M	BH035 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31562	B19-Se31563	B19-Se31564	B19-Se31565
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	52	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	3.9	-	-
<2mm Fraction	0.005	g	-	83	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	1	%	-	25	-	-

Client Sample ID			BH035 - 2.0-2.25M	BH035 - 2.25-2.5M	BH035 - 2.5-2.75M	BH035 - 2.75-3.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31566	B19-Se31567	B19-Se31568	B19-Se31569
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.0	6.2	6.2	6.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.2	5.2	5.3	5.2
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	5.0	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	13	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.020	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	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	-	0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	13	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	< 1	-	-
<2mm Fraction	0.005	g	-	84	-	-
>2mm Fraction	0.005	g	-	2.8	-	-
Analysed Material	0.1	%	-	97	-	-
Extraneous Material	0.1	%	-	3.2	-	-
% Moisture						
	1	%	-	16	-	-

Client Sample ID			BH036 - 0.0-0.25M	BH036 - 0.25-0.5M	BH036 - 0.5-0.75M	BH036 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31570	B19-Se31571	B19-Se31572	B19-Se31573
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.8	5.8	5.6	5.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.4	4.2	4.4	5.1
Reaction Ratings**S05		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.7	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	50	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.080	-	-	-
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	< 0.02	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-
HCl Extractable Sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	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	0.08	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	50	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	3.8	-	-	-
<2mm Fraction	0.005	g	26	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture	1	%	15	-	-	-

Client Sample ID			BH036 - 1.00-1.25M	BH036 - 1.25-1.5M	BH036 - 1.5-1.75M	BH036 - 1.75-2.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31574	B19-Se31575	B19-Se31576	B19-Se31577
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.9	4.5	4.5	4.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.9	3.9	3.9	4.0
Reaction Ratings**S05		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.4	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	34	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.050	-	-	-
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	< 0.02	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-

Client Sample ID			BH036 - 1.00-1.25M	BH036 - 1.25-1.5M	BH036 - 1.5-1.75M	BH036 - 1.75-2.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31574	B19-Se31575	B19-Se31576	B19-Se31577
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	< 0.02	-	-	-
Net Acid soluble sulfur	0.02	% S	< 0.02	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	< 10	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	< 0.02	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	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	0.05	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	34	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	2.6	-	-	-
<2mm Fraction	0.005	g	72	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture	1	%	15	-	-	-

Client Sample ID			BH036 - 2.0-2.25M	BH036 - 2.25-2.5M	BH036 - 2.5-2.75M	BH036 - 2.75-3.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31578	B19-Se31579	B19-Se31580	B19-Se31581
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.6	4.7	4.8	4.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.9	4.1	4.3	4.3
Reaction Ratings ^{S05}		comment	4.0	2.0	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.1	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	53	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.090	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	0.02	-	-
Net Acid soluble sulfur	0.02	% S	-	0.02	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	10	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	< 0.02	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	0.09	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	63	-	-

Client Sample ID			BH036 - 2.0-2.25M	BH036 - 2.25-2.5M	BH036 - 2.5-2.75M	BH036 - 2.75-3.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31578	B19-Se31579	B19-Se31580	B19-Se31581
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	4.8	-	-
<2mm Fraction	0.005	g	-	88	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	1	%	-	11	-	-

Client Sample ID			BH018 - 0.0-0.25M	BH018 - 0.25-0.5M	BH018 - 0.5-0.75M	BH018 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31733	B19-Se31734	B19-Se31735	B19-Se31736
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.0	6.6	7.8	8.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.5	4.7	7.7	8.4
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	6.2	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	4.9	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.010	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	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	-	-	< 0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	< 10	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	< 1	-
<2mm Fraction	0.005	g	-	-	27	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture						
	1	%	-	-	14	-

Client Sample ID			BH018 - 1.00-1.25M	BH018 - 1.25-1.5M	BH018 - 1.5-1.75M	BH018 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31737	B19-Se31738	B19-Se31739	B19-Se31740
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.6	8.8	8.7	8.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.6	8.7	8.8	8.9
Reaction Ratings**S05		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	7.5
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	< 2
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	< 0.003
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	-	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	-	-	< 3
Sulfur - KCl Extractable	0.02	% S	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	-	0.94
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	-	-	-	190
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	-	-	-	0.30
ANC Fineness Factor		factor	-	-	-	1.5
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	-	-	-	< 0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	< 10
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	< 1
<2mm Fraction	0.005	g	-	-	-	51
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture	1	%	-	-	-	16

Client Sample ID			BH018 - 2.0-2.25M	BH018 - 2.25-2.5M	BH018 - 2.5-2.75M	BH018 - 2.75-3.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se31741	B19-Se31742	B19-Se31743	B19-Se31744
Date Sampled			Sep 13, 2019	Sep 13, 2019	Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.9	9.0	8.9	8.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.9	9.0	8.9	8.8
Reaction Ratings**S05		comment	4.0	4.0	4.0	4.0

Client Sample ID			BH018 - 3.00-3.25M	BH018 - 3.25-3.5M
Sample Matrix			Soil	Soil
Eurofins Sample No.			B19-Se31745	B19-Se31746
Date Sampled			Sep 13, 2019	Sep 13, 2019
Test/Reference	LOR	Unit		
Acid Sulfate Soils Field pH Test				
pH-F (Field pH test)*	0.1	pH Units	9.0	8.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.2	9.0
Reaction Ratings* ^{S05}		comment	4.0	4.0

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

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 - Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests	Brisbane	Sep 23, 2019	7 Days
Chromium Suite (SKCI) - Method: LTM-GEN-7070	Brisbane	Sep 24, 2019	6 Week
% Moisture - Method: LTM-GEN-7080 Moisture	Brisbane	Sep 20, 2019	14 Days

Company Name: Tectonic Geotechnical Pty Ltd	Order No.:	Received: Sep 19, 2019 9:00 AM
Address: 40A Glen Vista Place Chevalum Qld 4555	Report #: 678154	Due: Sep 26, 2019
Project Name: MIBA - NORTH HARBOUR	Phone: 07 5478 9642	Priority: 5 Day
Project ID: 19210	Fax:	Contact Name: Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	BH031 - 0.0-0.25M	Sep 13, 2019		Soil	B19-Se31510	X	X	X
2	BH031 - 0.25-0.5M	Sep 13, 2019		Soil	B19-Se31511	X		
3	BH031 - 0.5-0.75M	Sep 13, 2019		Soil	B19-Se31512	X		
4	BH031 - 0.75-1.00M	Sep 13, 2019		Soil	B19-Se31513	X		
5	BH031 - 1.00-1.25M	Sep 13, 2019		Soil	B19-Se31514	X	X	X
6	BH031 - 1.25-	Sep 13, 2019		Soil	B19-Se31515	X		

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 19, 2019 9:00 AM
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Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	5 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
7	BH031 - 1.5-1.75M	Sep 13, 2019		Soil	B19-Se31516	X		
8	BH031 - 1.75-2.0M	Sep 13, 2019		Soil	B19-Se31517	X		
9	BH031 - 2.0-2.25M	Sep 13, 2019		Soil	B19-Se31518	X	X	X
10	BH031 - 2.25-2.5M	Sep 13, 2019		Soil	B19-Se31519	X		
11	BH031 - 2.5-2.75M	Sep 13, 2019		Soil	B19-Se31520	X		
12	BH031 - 2.75-3.00M	Sep 13, 2019		Soil	B19-Se31521	X		
13	BH032 - 0.0-	Sep 13, 2019		Soil	B19-Se31522	X		

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	0.25M							
14	BH032 - 0.25-0.5M	Sep 13, 2019		Soil	B19-Se31523	X	X	X
15	BH032 - 0.5-0.75M	Sep 13, 2019		Soil	B19-Se31524	X		
16	BH032 - 0.75-1.00M	Sep 13, 2019		Soil	B19-Se31525	X		
17	BH032 - 1.00-1.25M	Sep 13, 2019		Soil	B19-Se31526	X		
18	BH032 - 1.25-1.5M	Sep 13, 2019		Soil	B19-Se31527	X	X	X
19	BH032 - 1.5-1.75M	Sep 13, 2019		Soil	B19-Se31528	X		
20	BH032 - 1.75-	Sep 13, 2019		Soil	B19-Se31529	X		

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Eurofins Analytical Services Manager : Ryan Gilbert					

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	2.0M							
21	BH032 - 2.0-2.25M	Sep 13, 2019		Soil	B19-Se31530	X		
22	BH032 - 2.25-2.5M	Sep 13, 2019		Soil	B19-Se31531	X		
23	BH032 - 2.5-2.75M	Sep 13, 2019		Soil	B19-Se31532	X		
24	BH032 - 2.75-3.00M	Sep 13, 2019		Soil	B19-Se31533	X	X	X
25	BH033 - 0.0-0.25M	Sep 13, 2019		Soil	B19-Se31534	X		
26	BH033 - 0.25-0.5M	Sep 13, 2019		Soil	B19-Se31535	X		
27	BH033 - 0.5-	Sep 13, 2019		Soil	B19-Se31536	X		

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	0.75M							
28	BH033 - 0.75-1.0M	Sep 13, 2019		Soil	B19-Se31537	X	X	X
29	BH033 - 1.0-1.25M	Sep 13, 2019		Soil	B19-Se31538	X		
30	BH033 - 1.25-1.5M	Sep 13, 2019		Soil	B19-Se31539	X		
31	BH033 - 1.5-1.75M	Sep 13, 2019		Soil	B19-Se31540	X		
32	BH033 - 1.75-2.0M	Sep 13, 2019		Soil	B19-Se31541	X	X	X
33	BH033 - 2.0-2.25M	Sep 13, 2019		Soil	B19-Se31542	X		
34	BH033 - 2.25-	Sep 13, 2019		Soil	B19-Se31543	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	2.5M							
35	BH033 - 2.5-2.75M	Sep 13, 2019		Soil	B19-Se31544	X	X	X
36	BH033 - 2.75-3.00M	Sep 13, 2019		Soil	B19-Se31545	X		
37	BH034 - 0.0-0.25M	Sep 13, 2019		Soil	B19-Se31546	X	X	X
38	BH034 - 0.25-0.5M	Sep 13, 2019		Soil	B19-Se31547	X	X	X
39	BH034 - 0.5-0.75M	Sep 13, 2019		Soil	B19-Se31548	X		
40	BH034 - 0.75-1.00M	Sep 13, 2019		Soil	B19-Se31549	X		
41	BH034 - 1.00-	Sep 13, 2019		Soil	B19-Se31550	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.25M							
42	BH034 - 1.25-1.5M	Sep 13, 2019		Soil	B19-Se31551	X	X	X
43	BH034 - 1.5-1.75M	Sep 13, 2019		Soil	B19-Se31552	X		
44	BH034 - 1.75-2.0M	Sep 13, 2019		Soil	B19-Se31553	X		
45	BH034 - 2.0-2.25M	Sep 13, 2019		Soil	B19-Se31554	X		
46	BH034 - 2.25-2.5M	Sep 13, 2019		Soil	B19-Se31555	X		
47	BH034 - 2.5-2.75M	Sep 13, 2019		Soil	B19-Se31556	X		
48	BH034 - 2.75-	Sep 13, 2019		Soil	B19-Se31557	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	3.0M							
49	BH035 - 0.0-0.25M	Sep 13, 2019		Soil	B19-Se31558	X	X	X
50	BH035 - 0.25-0.5M	Sep 13, 2019		Soil	B19-Se31559	X		
51	BH035 - 0.5-0.75M	Sep 13, 2019		Soil	B19-Se31560	X		
52	BH035 - 0.75-1.00M	Sep 13, 2019		Soil	B19-Se31561	X		
53	BH035 - 1.00-1.25M	Sep 13, 2019		Soil	B19-Se31562	X		
54	BH035 - 1.25-1.5M	Sep 13, 2019		Soil	B19-Se31563	X	X	X
55	BH035 - 1.5-	Sep 13, 2019		Soil	B19-Se31564	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.75M							
56	BH035 - 1.75-2.0M	Sep 13, 2019		Soil	B19-Se31565	X		
57	BH035 - 2.0-2.25M	Sep 13, 2019		Soil	B19-Se31566	X		
58	BH035 - 2.25-2.5M	Sep 13, 2019		Soil	B19-Se31567	X	X	X
59	BH035 - 2.5-2.75M	Sep 13, 2019		Soil	B19-Se31568	X		
60	BH035 - 2.75-3.0M	Sep 13, 2019		Soil	B19-Se31569	X		
61	BH036 - 0.0-0.25M	Sep 13, 2019		Soil	B19-Se31570	X	X	X
62	BH036 - 0.25-	Sep 13, 2019		Soil	B19-Se31571	X		

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	Fax:	Contact Name: Mark Thomson
Project Name: MIBA - NORTH HARBOUR		
Project ID: 19210		

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	0.5M							
63	BH036 - 0.5-0.75M	Sep 13, 2019		Soil	B19-Se31572	X		
64	BH036 - 0.75-1.00M	Sep 13, 2019		Soil	B19-Se31573	X		
65	BH036 - 1.00-1.25M	Sep 13, 2019		Soil	B19-Se31574	X	X	X
66	BH036 - 1.25-1.5M	Sep 13, 2019		Soil	B19-Se31575	X		
67	BH036 - 1.5-1.75M	Sep 13, 2019		Soil	B19-Se31576	X		
68	BH036 - 1.75-2.00M	Sep 13, 2019		Soil	B19-Se31577	X		
69	BH036 - 2.0-	Sep 13, 2019		Soil	B19-Se31578	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	2.25M							
70	BH036 - 2.25-2.5M	Sep 13, 2019		Soil	B19-Se31579	X	X	X
71	BH036 - 2.5-2.75M	Sep 13, 2019		Soil	B19-Se31580	X		
72	BH036 - 2.75-3.00M	Sep 13, 2019		Soil	B19-Se31581	X		
73	BH018 - 0.0-0.25M	Sep 13, 2019		Soil	B19-Se31733	X		
74	BH018 - 0.25-0.5M	Sep 13, 2019		Soil	B19-Se31734	X		
75	BH018 - 0.5-0.75M	Sep 13, 2019		Soil	B19-Se31735	X	X	X
76	BH018 - 0.75-	Sep 13, 2019		Soil	B19-Se31736	X		

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Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.00M							
77	BH018 - 1.00-1.25M	Sep 13, 2019		Soil	B19-Se31737	X		
78	BH018 - 1.25-1.5M	Sep 13, 2019		Soil	B19-Se31738	X		
79	BH018 - 1.5-1.75M	Sep 13, 2019		Soil	B19-Se31739	X		
80	BH018 - 1.75-2.0M	Sep 13, 2019		Soil	B19-Se31740	X	X	
81	BH018 - 2.0-2.25M	Sep 13, 2019		Soil	B19-Se31741	X		
82	BH018 - 2.25-2.5M	Sep 13, 2019		Soil	B19-Se31742	X		
83	BH018 - 2.5-	Sep 13, 2019		Soil	B19-Se31743	X		

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Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	2.75M							
84	BH018 - 2.75-3.00M	Sep 13, 2019		Soil	B19-Se31744	X		
85	BH018 - 3.00-3.25M	Sep 13, 2019		Soil	B19-Se31745	X		
86	BH018 - 3.25-3.5M	Sep 13, 2019		Soil	B19-Se31746	X		
Test Counts						86	20	20

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.
- 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.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- 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

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

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

QC Data General Comments

- 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.
- 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.
- Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
- 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.
- 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.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
- For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery										
Chromium Suite (SKCI)										
Chromium Reducible Sulfur				%	100			70-130	Pass	
Acid Neutralising Capacity (ANCbt)				%	97			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1				Acceptance Limits	Pass Limits	Qualifying Code
Duplicate										
Chromium Suite (SKCI)										
					Result 1	Result 2	RPD			
pH-KCL	B19-Se31510	CP	pH Units	4.2	4.2	<1		30%	Pass	
Acid trail - Titratable Actual Acidity	B19-Se31510	CP	mol H+/t	170	170	<1		30%	Pass	
sulfidic - TAA equiv. S% pyrite	B19-Se31510	CP	% pyrite S	0.27	0.27	1.0		30%	Pass	
Chromium Reducible Sulfur	B19-Se31510	CP	% S	0.036	0.040	11		30%	Pass	
Chromium Reducible Sulfur -acidity units	B19-Se31510	CP	mol H+/t	22	25	11		30%	Pass	
Sulfur - KCl Extractable	B19-Se31510	CP	% S	< 0.02	< 0.02	<1		30%	Pass	
Net Acid soluble sulfur	B19-Se31510	CP	% S	0.03	0.03	2.0		30%	Pass	
Net Acid soluble sulfur - acidity units	B19-Se31510	CP	mol H+/t	13	13	2.0		30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	B19-Se31510	CP	% S	0.02	0.02	2.0		30%	Pass	
Acid Neutralising Capacity (ANCbt)	B19-Se31510	CP	% CaCO3	n/a	n/a	n/a		30%	Pass	
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	B19-Se31510	CP	% S	n/a	n/a	n/a		30%	Pass	
ANC Fineness Factor	B19-Se31510	CP	factor	1.5	1.5	<1		30%	Pass	
CRS Suite - Net Acidity (Sulfur Units)	B19-Se31510	CP	% S	0.32	0.33	n/a		30%	Pass	
CRS Suite - Net Acidity (Acidity Units)	B19-Se31510	CP	mol H+/t	200	200	n/a		30%	Pass	
CRS Suite - Liming Rate	B19-Se31510	CP	kg CaCO3/t	15	15	2.0		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test										
					Result 1	Result 2	RPD			
pH-F (Field pH test)*	B19-Se31512	CP	pH Units	5.3	5.4	pass		30%	Pass	
Reaction Ratings*	B19-Se31512	CP	comment	2.0	2.0	pass		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test										
					Result 1	Result 2	RPD			
% Moisture	B19-Se31514	CP	%	28	27	1.0		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test										
					Result 1	Result 2	RPD			
pH-F (Field pH test)*	B19-Se31522	CP	pH Units	6.6	6.5	pass		30%	Pass	
Reaction Ratings*	B19-Se31522	CP	comment	4.0	4.0	pass		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test										
					Result 1	Result 2	RPD			
pH-F (Field pH test)*	B19-Se31532	CP	pH Units	7.4	7.5	pass		30%	Pass	
Reaction Ratings*	B19-Se31532	CP	comment	4.0	4.0	pass		30%	Pass	
Duplicate										
Chromium Suite (SKCI)										
					Result 1	Result 2	RPD			
pH-KCL	B19-Se31541	CP	pH Units	5.0	5.0	<1		30%	Pass	
Acid trail - Titratable Actual Acidity	B19-Se31541	CP	mol H+/t	13	12	5.1		30%	Pass	
sulfidic - TAA equiv. S% pyrite	B19-Se31541	CP	% pyrite S	0.020	0.020	5.0		30%	Pass	
Chromium Reducible Sulfur	B19-Se31541	CP	% S	< 0.005	< 0.005	<1		30%	Pass	
Chromium Reducible Sulfur -acidity units	B19-Se31541	CP	mol H+/t	< 3	< 3	<1		30%	Pass	
Sulfur - KCl Extractable	B19-Se31541	CP	% S	< 0.02	< 0.02	<1		30%	Pass	
ANC Fineness Factor	B19-Se31541	CP	factor	1.5	1.5	<1		30%	Pass	

Duplicate								
Chromium Suite (SKCI)				Result 1	Result 2	RPD		
CRS Suite - Net Acidity (Sulfur Units)	B19-Se31541	CP	% S	0.02	0.02	n/a	30%	Pass
CRS Suite - Net Acidity (Acidity Units)	B19-Se31541	CP	mol H+/t	13	12	n/a	30%	Pass
CRS Suite - Liming Rate	B19-Se31541	CP	kg CaCO3/t	< 1	< 1	<1	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se31542	CP	pH Units	5.1	5.1	pass	30%	Pass
Reaction Ratings*	B19-Se31542	CP	comment	2.0	2.0	pass	30%	Pass
Duplicate								
Chromium Suite (SKCI)				Result 1	Result 2	RPD		
pH-KCL	B19-Se31551	CP	pH Units	5.8	5.8	<1	30%	Pass
Acid trail - Titratable Actual Acidity	B19-Se31551	CP	mol H+/t	6.2	5.8	7.6	30%	Pass
sulfidic - TAA equiv. S% pyrite	B19-Se31551	CP	% pyrite S	0.010	0.010	8.0	30%	Pass
Chromium Reducible Sulfur	B19-Se31551	CP	% S	< 0.005	< 0.005	<1	30%	Pass
Chromium Reducible Sulfur -acidity units	B19-Se31551	CP	mol H+/t	< 3	< 3	<1	30%	Pass
Sulfur - KCl Extractable	B19-Se31551	CP	% S	< 0.02	< 0.02	<1	30%	Pass
Net Acid soluble sulfur	B19-Se31551	CP	% S	n/a	n/a	n/a	30%	Pass
Net Acid soluble sulfur - acidity units	B19-Se31551	CP	mol H+/t	n/a	n/a	n/a	30%	Pass
Net Acid soluble sulfur - equivalent S% pyrite	B19-Se31551	CP	% S	n/a	n/a	n/a	30%	Pass
Acid Neutralising Capacity (ANCbt)	B19-Se31551	CP	% CaCO3	n/a	n/a	n/a	30%	Pass
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	B19-Se31551	CP	% S	n/a	n/a	n/a	30%	Pass
ANC Fineness Factor	B19-Se31551	CP	factor	1.5	1.5	<1	30%	Pass
CRS Suite - Net Acidity (Sulfur Units)	B19-Se31551	CP	% S	< 0.02	< 0.02	<1	30%	Pass
CRS Suite - Net Acidity (Acidity Units)	B19-Se31551	CP	mol H+/t	< 10	< 10	<1	30%	Pass
CRS Suite - Liming Rate	B19-Se31551	CP	kg CaCO3/t	< 1	< 1	<1	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se31562	CP	pH Units	5.5	5.5	pass	30%	Pass
Reaction Ratings*	B19-Se31562	CP	comment	4.0	4.0	pass	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se31572	CP	pH Units	5.6	5.6	pass	30%	Pass
Reaction Ratings*	B19-Se31572	CP	comment	4.0	4.0	pass	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se31733	CP	pH Units	6.0	6.2	pass	30%	Pass
Reaction Ratings*	B19-Se31733	CP	comment	4.0	4.0	pass	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se31743	CP	pH Units	8.9	8.9	pass	30%	Pass
Reaction Ratings*	B19-Se31743	CP	comment	4.0	4.0	pass	30%	Pass

Comments
Sample Integrity

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

Qualifier Codes/Comments

Code	Description
S01	Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO ₃) 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/m ³ in-situ soil' multiply 'reported results' x 'wet bulk density of soil in t/m ³ '
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5
S03	Acid Neutralising Capacity is only required if the pHKCl is 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
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised By

Ryan Gilbert	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](#).

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 Accreditation Number 1261
 Site Number 20794

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 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: **Mark Thomson**

Report **679492-S**
 Project name **MIBA - NORTH HARBOUR**
 Project ID **19210**
 Received Date **Sep 27, 2019**

Client Sample ID			BH037 - 0.0-0.25M	BH037 - 0.25-0.5M	BH037 - 0.5-0.75M	BH037 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41486	B19-Se41487	B19-Se41488	B19-Se41489
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.2	5.9	5.5	5.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.5	3.9	4.0	3.9
Reaction Ratings* ^{S05}		comment	4.0	3.0	3.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	4.5	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	41	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.070	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	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	-	-	0.07	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	41	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	3.1	-
<2mm Fraction	0.005	g	-	-	40	-
>2mm Fraction	0.005	g	-	-	0.28	-
Analysed Material	0.1	%	-	-	99	-
Extraneous Material	0.1	%	-	-	0.7	-
% Moisture	1	%	-	-	11	-

Client Sample ID			BH037 - 1.00-1.25M	BH037 - 1.25-1.5M	BH037 - 1.5-1.75M	BH037 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41490	B19-Se41491	B19-Se41492	B19-Se41493
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.2	4.8	5.3	5.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.8	3.9	4.3	4.4
Reaction Ratings**S05		comment	1.0	2.0	1.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	4.5	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	45	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.070	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	< 0.02	-
Net Acid soluble sulfur	0.02	% S	-	-	< 0.02	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	< 10	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	< 0.02	-
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	-	-	0.07	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	45	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	3.3	-
<2mm Fraction	0.005	g	-	-	56	-
>2mm Fraction	0.005	g	-	-	0.55	-
Analysed Material	0.1	%	-	-	99	-
Extraneous Material	0.1	%	-	-	1.0	-
% Moisture	1	%	-	-	13	-

Client Sample ID			BH037 - 2.0-2.25M	BH037 - 2.25-2.5M	BH037 - 2.5-2.75M	BH037 - 2.75-3.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41494	B19-Se41495	B19-Se41496	B19-Se41497
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.3	5.2	5.2	5.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.1	4.3	4.5	4.4
Reaction Ratings**S05		comment	2.0	1.0	2.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	4.2	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	72	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.12	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-

Client Sample ID			BH037 - 2.0-2.25M	BH037 - 2.25-2.5M	BH037 - 2.5-2.75M	BH037 - 2.75-3.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41494	B19-Se41495	B19-Se41496	B19-Se41497
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	-	< 0.02	-
Net Acid soluble sulfur	0.02	% S	-	-	< 0.02	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	< 10	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	< 0.02	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	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	-	-	0.12	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	72	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	5.4	-
<2mm Fraction	0.005	g	-	-	52	-
>2mm Fraction	0.005	g	-	-	0.74	-
Analysed Material	0.1	%	-	-	99	-
Extraneous Material	0.1	%	-	-	1.4	-
% Moisture	1	%	-	-	13	-

Client Sample ID			BH038 - 0.0-0.25M	BH038 - 0.25-0.5M	BH038 - 0.5-0.75M	BH038 - 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41498	B19-Se41499	B19-Se41500	B19-Se41501
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.8	5.7	4.9	4.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.2	4.0	4.1	3.9
Reaction Ratings ^{S05}		comment	3.0	3.0	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.5	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	46	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.070	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	0.07	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	46	-	-

Client Sample ID			BH038 - 0.0-0.25M	BH038 - 0.25-0.5M	BH038 - 0.5-0.75M	BH038 - 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41498	B19-Se41499	B19-Se41500	B19-Se41501
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	3.5	-	-
<2mm Fraction	0.005	g	-	60	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	1	%	-	12	-	-

Client Sample ID			BH038 - 1.0-1.25M	BH038 - 1.25-1.5M	BH038 - 1.5-1.75M	BH038 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41502	B19-Se41503	B19-Se41504	B19-Se41505
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.6	4.6	4.8	4.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.7	3.7	3.9	4.0
Reaction Ratings* ^{S05}		comment	2.0	2.0	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.4	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	47	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.070	-	-
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	-	0.05	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	0.11	-	-
Net Acid soluble sulfur	0.02	% S	-	0.06	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	27	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	0.04	-	-
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	-	0.12	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	74	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	5.6	-	-
<2mm Fraction	0.005	g	-	37	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	1	%	-	17	-	-

Client Sample ID			BH038 - 2.0-2.25M	BH038 - 2.25-2.5M	BH038 - 2.5-2.75M	BH038 - 2.75-3.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41506	B19-Se41507	B19-Se41508	B19-Se41509
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.7	5.0	5.0	5.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.3	4.6	4.3	4.7
Reaction Ratings**S05		comment	2.0	2.0	2.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	4.6	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	28	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.040	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	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	-	-	0.04	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	28	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	2.1	-
<2mm Fraction	0.005	g	-	-	60	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture	1	%	-	-	13	-

Client Sample ID			BH039 - 0.0-0.25M	BH039 - 0.25-0.5M	BH039 - 0.5-0.75M	BH039 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41510	B19-Se41511	B19-Se41512	B19-Se41513
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.4	6.3	5.7	5.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.2	4.1	4.4	4.3
Reaction Ratings**S05		comment	4.0	4.0	4.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.6	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	43	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.070	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-

Client Sample ID			BH039 - 0.0-0.25M	BH039 - 0.25-0.5M	BH039 - 0.5-0.75M	BH039 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41510	B19-Se41511	B19-Se41512	B19-Se41513
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	0.07	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	43	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	3.2	-	-
<2mm Fraction	0.005	g	-	79	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	20	-	-

Client Sample ID			BH039 - 1.00-1.25M	BH039 - 1.25-1.5M	BH039 - 1.5-1.75M	BH039 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41514	B19-Se41515	B19-Se41516	B19-Se41517
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.3	5.0	5.1	5.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.6	4.6	4.5	4.4
Reaction Ratings ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.2	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	49	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.080	-	-
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	-	0.07	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	0.15	-	-
Net Acid soluble sulfur	0.02	% S	-	0.08	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	38	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	0.06	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	0.14	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	87	-	-

Client Sample ID			BH039 - 1.00-1.25M	BH039 - 1.25-1.5M	BH039 - 1.5-1.75M	BH039 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41514	B19-Se41515	B19-Se41516	B19-Se41517
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	6.5	-	-
<2mm Fraction	0.005	g	-	91	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	1	%	-	20	-	-

Client Sample ID			BH039 - 2.0-2.25M	BH039 - 2.25-2.5M	BH039 - 2.5-2.75M	BH039 - 2.75-3.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41518	B19-Se41519	B19-Se41520	B19-Se41521
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.2	5.5	5.5	5.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.7	4.4	4.3	4.3
Reaction Ratings* ^{S05}		comment	4.0	1.0	1.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.5	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	17	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.030	-	-	-
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	0.03	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-
HCl Extractable Sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	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	0.03	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	17	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	1.3	-	-	-
<2mm Fraction	0.005	g	140	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture						
	1	%	17	-	-	-

Client Sample ID			BH040 - 0.0-0.25M	BH040 - 0.25-0.5M	BH040 - 0.5-0.75M	BH040 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41522	B19-Se41523	B19-Se41524	B19-Se41525
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.2	6.8	7.5	7.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.2	4.3	5.7	6.0
Reaction Ratings* ^{S05}		comment	3.0	1.0	1.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	5.3	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	7.7	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.010	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	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	-	< 0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	< 1	-	-
<2mm Fraction	0.005	g	-	63	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	10	-	-

Client Sample ID			BH040 - 1.00-1.25M	BH040 - 1.25-1.5M	BH040 - 1.5-1.75M	BH040 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41526	B19-Se41527	B19-Se41528	B19-Se41529
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.2	8.0	8.4	8.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.8	6.4	8.8	7.7
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	6.3	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	< 2	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	< 0.003	-	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	< 0.005	-	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	< 3	-	-
Sulfur - KCl Extractable	0.02	% S	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-

Client Sample ID			BH040 - 1.00-1.25M	BH040 - 1.25-1.5M	BH040 - 1.5-1.75M	BH040 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41526	B19-Se41527	B19-Se41528	B19-Se41529
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	< 0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	< 1	-	-
<2mm Fraction	0.005	g	-	91	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	19	-	-

Client Sample ID			BH040 - 2.0-2.25M	BH040 - 2.25-2.5M	BH040 - 2.5-2.75M	BH040 - 2.75-3.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41530	B19-Se41531	B19-Se41532	B19-Se41533
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.9	9.1	8.8	8.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.4	9.4	9.4	9.5
Reaction Ratings ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	8.7	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	< 2	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	< 0.003	-	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	< 0.005	-	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	< 3	-	-
Sulfur - KCl Extractable	0.02	% S	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	5.0	-	-
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	-	990	-	-
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	-	1.6	-	-
ANC Fineness Factor		factor	-	1.5	-	-
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	-	< 0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	-	-

Client Sample ID			BH040 - 2.0-2.25M	BH040 - 2.25-2.5M	BH040 - 2.5-2.75M	BH040 - 2.75-3.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41530	B19-Se41531	B19-Se41532	B19-Se41533
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	< 1	-	-
<2mm Fraction	0.005	g	-	46	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	1	%	-	15	-	-

Client Sample ID			BH040 - 3.0-3.25M	BH040 - 3.25-3.5M	BH042 - 0.0-0.25M	BH042 - 0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41534	B19-Se41535	B19-Se41536	B19-Se41537
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.0	8.9	5.7	6.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.2	9.6	3.1	4.6
Reaction Ratings* ^{S05}		comment	4.0	4.0	3.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	5.0	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	22	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.030	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	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	-	-	0.03	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	22	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	1.6	-
<2mm Fraction	0.005	g	-	-	22	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture						
	1	%	-	-	11	-

Client Sample ID			BH042 - 0.5-0.75M	BH042 - 0.75-1.0M	BH042 - 1.0-1.25M	BH042 - 1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41538	B19-Se41539	B19-Se41540	B19-Se41541
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.4	6.5	7.3	7.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.0	4.9	7.5	6.5
Reaction Ratings* ^{S05}		comment	4.0	2.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	6.1	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	2.9	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	< 0.003	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	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	-	-	< 0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	< 10	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	< 1	-
<2mm Fraction	0.005	g	-	-	52	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture	1	%	-	-	15	-

Client Sample ID			BH042 - 1.5-1.75M	BH042 - 1.75-2.0M	BH042 - 2.0-2.25M	BH042 - 2.25-2.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41542	B19-Se41543	B19-Se41544	B19-Se41545
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.1	7.5	7.4	7.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.1	8.2	8.5	8.4
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	6.2	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	< 2	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	< 0.003	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	-	< 0.005	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	-	< 3	-
Sulfur - KCl Extractable	0.02	% S	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-

Client Sample ID			BH042 - 1.5-1.75M	BH042 - 1.75-2.0M	BH042 - 2.0-2.25M	BH042 - 2.25-2.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41542	B19-Se41543	B19-Se41544	B19-Se41545
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	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	-	-	< 0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	< 10	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	< 1	-
<2mm Fraction	0.005	g	-	-	36	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture	1	%	-	-	17	-

Client Sample ID			BH042 - 2.5-2.75M	BH042 - 2.75-3.0M	BH042 - 3.0-3.25M	BH042 - 3.25-3.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41546	B19-Se41547	B19-Se41548	B19-Se41549
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.3	7.8	8.1	8.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.1	8.1	8.1	7.8
Reaction Ratings ^{S05}		comment	2.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	6.0	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	< 2	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	< 0.003	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	-	< 0.005	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	-	< 3	-
Sulfur - KCl Extractable	0.02	% S	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	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	-	-	< 0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	< 10	-

Client Sample ID			BH042 - 2.5-2.75M	BH042 - 2.75-3.0M	BH042 - 3.0-3.25M	BH042 - 3.25-3.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41546	B19-Se41547	B19-Se41548	B19-Se41549
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	< 1	-
<2mm Fraction	0.005	g	-	-	50	-
>2mm Fraction	0.005	g	-	-	2.0	-
Analysed Material	0.1	%	-	-	96	-
Extraneous Material	0.1	%	-	-	3.8	-
% Moisture						
	1	%	-	-	13	-

Client Sample ID			BH043 - 0.0-0.25M	BH043 - 0.25-0.5M	BH043 - 0.5-0.75M	BH043 - 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41550	B19-Se41551	B19-Se41552	B19-Se41553
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.5	6.5	6.3	6.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.6	4.2	4.7	6.1
Reaction Ratings* ^{S05}		comment	4.0	4.0	2.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	4.8
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	20
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.030
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	-	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	-	-	-	0.03
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	20
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	1.5
<2mm Fraction	0.005	g	-	-	-	49
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture						
	1	%	-	-	-	18

Client Sample ID			BH043 - 1.0-1.25M	BH043 - 1.25-1.5M	BH043 - 1.5-1.75M	BH043 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41554	B19-Se41555	B19-Se41556	B19-Se41557
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.8	7.6	7.4	7.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.9	7.1	7.1	8.3
Reaction Ratings**S05		comment	2.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	5.3
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	7.3
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.010
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	-	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	-	-	-	< 0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	< 10
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	< 1
<2mm Fraction	0.005	g	-	-	-	60
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture	1	%	-	-	-	17

Client Sample ID			BH043 - 2.0-2.25M	BH043 - 2.25-2.5M	BH043 - 2.5-2.75M	BH043 - 2.75-3.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41558	B19-Se41559	B19-Se41560	B19-Se41561
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.1	8.1	8.2	8.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.5	8.3	8.4	7.5
Reaction Ratings**S05		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	6.5
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	< 2
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	< 0.003
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	-	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	-	-	< 3
Sulfur - KCl Extractable	0.02	% S	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0

Client Sample ID			BH043 - 2.0-2.25M	BH043 - 2.25-2.5M	BH043 - 2.5-2.75M	BH043 - 2.75-3.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41558	B19-Se41559	B19-Se41560	B19-Se41561
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	-	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	-	-	-	< 0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	< 10
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	-	< 1
<2mm Fraction	0.005	g	-	-	-	65
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture	1	%	-	-	-	21

Client Sample ID			BH043 - 3.0-3.25M	BH043 - 3.25-3.5M	BH044 - 0.0-0.25M	BH044 - 0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41562	B19-Se41563	B19-Se41564	B19-Se41565
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.3	8.3	6.5	6.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.2	7.6	3.6	4.4
Reaction Ratings ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	4.6	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	26	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.040	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	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	-	-	0.04	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	26	-

Client Sample ID			BH043 - 3.0-3.25M	BH043 - 3.25-3.5M	BH044 - 0.0-0.25M	BH044 - 0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41562	B19-Se41563	B19-Se41564	B19-Se41565
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	2.0	-
<2mm Fraction	0.005	g	-	-	70	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture						
	1	%	-	-	10	-

Client Sample ID			BH044 - 0.5-0.75M	BH044 - 0.75-1.0M	BH044 - 1.0-1.25M	BH044 - 1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41566	B19-Se41567	B19-Se41568	B19-Se41569
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.8	7.8	7.9	8.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.9	7.1	6.9	7.6
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	6.3	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	< 2	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	< 0.003	-	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	< 0.005	-	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	< 3	-	-
Sulfur - KCl Extractable	0.02	% S	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	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	-	< 0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	< 1	-	-
<2mm Fraction	0.005	g	-	100	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	1	%	-	18	-	-

Client Sample ID			BH044 - 1.5-1.75M	BH044 - 1.75-2.0M	BH044 - 2.0-2.25M	BH044 - 2.25-2.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41570	B19-Se41571	B19-Se41572	B19-Se41573
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.3	8.1	8.4	8.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.4	8.0	8.1	7.2
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	6.4	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	< 2	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	< 0.003	-	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	< 0.005	-	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	< 3	-	-
Sulfur - KCl Extractable	0.02	% S	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	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	-	< 0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	< 1	-	-
<2mm Fraction	0.005	g	-	59	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	17	-	-

Client Sample ID			BH044 - 2.5-2.75M	BH044 - 2.75-3.0M	BH044 - 3.0-3.25M	BH044 - 3.25-3.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41574	B19-Se41575	B19-Se41576	B19-Se41577
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.4	8.2	8.5	8.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.2	7.1	7.3	7.1
Reaction Ratings* ^{S05}		comment	4.0	4.0	2.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	6.4	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	< 2	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	< 0.003	-	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	< 0.005	-	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	< 3	-	-
Sulfur - KCl Extractable	0.02	% S	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-

Client Sample ID			BH044 - 2.5-2.75M	BH044 - 2.75-3.0M	BH044 - 3.0-3.25M	BH044 - 3.25-3.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se41574	B19-Se41575	B19-Se41576	B19-Se41577
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	< 0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	< 1	-	-
<2mm Fraction	0.005	g	-	94	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	1	%	-	18	-	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

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 - Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests	Brisbane	Oct 01, 2019	7 Days
Chromium Suite (SKCI) - Method: LTM-GEN-7070	Brisbane	Oct 01, 2019	6 Week
% Moisture - Method: LTM-GEN-7080 Moisture	Brisbane	Sep 27, 2019	14 Days

Company Name: Tectonic Geotechnical Pty Ltd	Order No.:	Received: Sep 27, 2019 9:00 AM
Address: 40A Glen Vista Place Chevalum Qld 4555	Report #: 679492	Due: Oct 9, 2019
Project Name: MIBA - NORTH HARBOUR	Phone: 07 5478 9642	Priority: 7 Day
Project ID: 19210	Fax:	Contact Name: Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	BH037 - 0.0-0.25M	Sep 23, 2019		Soil	B19-Se41486	X		
2	BH037 - 0.25-0.5M	Sep 23, 2019		Soil	B19-Se41487	X		
3	BH037 - 0.5-0.75M	Sep 23, 2019		Soil	B19-Se41488	X	X	X
4	BH037 - 0.75-1.00M	Sep 23, 2019		Soil	B19-Se41489	X		
5	BH037 - 1.00-1.25M	Sep 23, 2019		Soil	B19-Se41490	X		
6	BH037 - 1.25-	Sep 23, 2019		Soil	B19-Se41491	X		

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Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	7 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
7	BH037 - 1.5-1.75M	Sep 23, 2019		Soil	B19-Se41492	X	X	X
8	BH037 - 1.75-2.0M	Sep 23, 2019		Soil	B19-Se41493	X		
9	BH037 - 2.0-2.25M	Sep 23, 2019		Soil	B19-Se41494	X		
10	BH037 - 2.25-2.5M	Sep 23, 2019		Soil	B19-Se41495	X		
11	BH037 - 2.5-2.75M	Sep 23, 2019		Soil	B19-Se41496	X	X	X
12	BH037 - 2.75-3.00M	Sep 23, 2019		Soil	B19-Se41497	X		
13	BH038 - 0.0-	Sep 23, 2019		Soil	B19-Se41498	X		

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	0.25M							
14	BH038 - 0.25-0.5M	Sep 23, 2019		Soil	B19-Se41499	X	X	X
15	BH038 - 0.5-0.75M	Sep 23, 2019		Soil	B19-Se41500	X		
16	BH038 - 0.75-1.0M	Sep 23, 2019		Soil	B19-Se41501	X		
17	BH038 - 1.0-1.25M	Sep 23, 2019		Soil	B19-Se41502	X		
18	BH038 - 1.25-1.5M	Sep 23, 2019		Soil	B19-Se41503	X	X	X
19	BH038 - 1.5-1.75M	Sep 23, 2019		Soil	B19-Se41504	X		
20	BH038 - 1.75-	Sep 23, 2019		Soil	B19-Se41505	X		

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	2.0M							
21	BH038 - 2.0-2.25M	Sep 23, 2019		Soil	B19-Se41506	X		
22	BH038 - 2.25-2.5M	Sep 23, 2019		Soil	B19-Se41507	X		
23	BH038 - 2.5-2.75M	Sep 23, 2019		Soil	B19-Se41508	X	X	X
24	BH038 - 2.75-3.0M	Sep 23, 2019		Soil	B19-Se41509	X		
25	BH039 - 0.0-0.25M	Sep 23, 2019		Soil	B19-Se41510	X		
26	BH039 - 0.25-0.5M	Sep 23, 2019		Soil	B19-Se41511	X	X	X
27	BH039 - 0.5-	Sep 23, 2019		Soil	B19-Se41512	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	0.75M							
28	BH039 - 0.75-1.00M	Sep 23, 2019		Soil	B19-Se41513	X		
29	BH039 - 1.00-1.25M	Sep 23, 2019		Soil	B19-Se41514	X		
30	BH039 - 1.25-1.5M	Sep 23, 2019		Soil	B19-Se41515	X	X	X
31	BH039 - 1.5-1.75M	Sep 23, 2019		Soil	B19-Se41516	X		
32	BH039 - 1.75-2.0M	Sep 23, 2019		Soil	B19-Se41517	X		
33	BH039 - 2.0-2.25M	Sep 23, 2019		Soil	B19-Se41518	X	X	X
34	BH039 - 2.25-	Sep 23, 2019		Soil	B19-Se41519	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	2.5M							
35	BH039 - 2.5-2.75M	Sep 23, 2019		Soil	B19-Se41520	X		
36	BH039 - 2.75-3.00M	Sep 23, 2019		Soil	B19-Se41521	X		
37	BH040 - 0.0-0.25M	Sep 23, 2019		Soil	B19-Se41522	X		
38	BH040 - 0.25-0.5M	Sep 23, 2019		Soil	B19-Se41523	X	X	X
39	BH040 - 0.5-0.75M	Sep 23, 2019		Soil	B19-Se41524	X		
40	BH040 - 0.75-1.00M	Sep 23, 2019		Soil	B19-Se41525	X		
41	BH040 - 1.00-	Sep 23, 2019		Soil	B19-Se41526	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.25M							
42	BH040 - 1.25-1.5M	Sep 23, 2019		Soil	B19-Se41527	X	X	X
43	BH040 - 1.5-1.75M	Sep 23, 2019		Soil	B19-Se41528	X		
44	BH040 - 1.75-2.0M	Sep 23, 2019		Soil	B19-Se41529	X		
45	BH040 - 2.0-2.25M	Sep 23, 2019		Soil	B19-Se41530	X		
46	BH040 - 2.25-2.5M	Sep 23, 2019		Soil	B19-Se41531	X	X	X
47	BH040 - 2.5-2.75M	Sep 23, 2019		Soil	B19-Se41532	X		
48	BH040 - 2.75-	Sep 23, 2019		Soil	B19-Se41533	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	3.0M							
49	BH040 - 3.0-3.25M	Sep 23, 2019		Soil	B19-Se41534	X		
50	BH040 - 3.25-3.5M	Sep 23, 2019		Soil	B19-Se41535	X		
51	BH042 - 0.0-0.25M	Sep 23, 2019		Soil	B19-Se41536	X	X	X
52	BH042 - 0.25-0.5M	Sep 23, 2019		Soil	B19-Se41537	X		
53	BH042 - 0.5-0.75M	Sep 23, 2019		Soil	B19-Se41538	X		
54	BH042 - 0.75-1.0M	Sep 23, 2019		Soil	B19-Se41539	X		
55	BH042 - 1.0-	Sep 23, 2019		Soil	B19-Se41540	X	X	X

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.25M							
56	BH042 - 1.25-1.5M	Sep 23, 2019		Soil	B19-Se41541	X		
57	BH042 - 1.5-1.75M	Sep 23, 2019		Soil	B19-Se41542	X		
58	BH042 - 1.75-2.0M	Sep 23, 2019		Soil	B19-Se41543	X		
59	BH042 - 2.0-2.25M	Sep 23, 2019		Soil	B19-Se41544	X	X	X
60	BH042 - 2.25-2.5M	Sep 23, 2019		Soil	B19-Se41545	X		
61	BH042 - 2.5-2.75M	Sep 23, 2019		Soil	B19-Se41546	X		
62	BH042 - 2.75-	Sep 23, 2019		Soil	B19-Se41547	X		

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	3.0M							
63	BH042 - 3.0-3.25M	Sep 23, 2019		Soil	B19-Se41548	X	X	X
64	BH042 - 3.25-3.5M	Sep 23, 2019		Soil	B19-Se41549	X		
65	BH043 - 0.0-0.25M	Sep 23, 2019		Soil	B19-Se41550	X		
66	BH043 - 0.25-0.5M	Sep 23, 2019		Soil	B19-Se41551	X		
67	BH043 - 0.5-0.75M	Sep 23, 2019		Soil	B19-Se41552	X		
68	BH043 - 0.75-1.0M	Sep 23, 2019		Soil	B19-Se41553	X	X	X
69	BH043 - 1.0-	Sep 23, 2019		Soil	B19-Se41554	X		

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.25M							
70	BH043 - 1.25-1.5M	Sep 23, 2019		Soil	B19-Se41555	X		
71	BH043 - 1.5-1.75M	Sep 23, 2019		Soil	B19-Se41556	X		
72	BH043 - 1.75-2.0M	Sep 23, 2019		Soil	B19-Se41557	X	X	X
73	BH043 - 2.0-2.25M	Sep 23, 2019		Soil	B19-Se41558	X		
74	BH043 - 2.25-2.5M	Sep 23, 2019		Soil	B19-Se41559	X		
75	BH043 - 2.5-2.75M	Sep 23, 2019		Soil	B19-Se41560	X		
76	BH043 - 2.75-	Sep 23, 2019		Soil	B19-Se41561	X	X	X

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Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	3.0M							
77	BH043 - 3.0-3.25M	Sep 23, 2019		Soil	B19-Se41562	X		
78	BH043 - 3.25-3.5M	Sep 23, 2019		Soil	B19-Se41563	X		
79	BH044 - 0.0-0.25M	Sep 23, 2019		Soil	B19-Se41564	X	X	X
80	BH044 - 0.25-0.5M	Sep 23, 2019		Soil	B19-Se41565	X		
81	BH044 - 0.5-0.75M	Sep 23, 2019		Soil	B19-Se41566	X		
82	BH044 - 0.75-1.0M	Sep 23, 2019		Soil	B19-Se41567	X	X	X
83	BH044 - 1.0-	Sep 23, 2019		Soil	B19-Se41568	X		

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Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.25M							
84	BH044 - 1.25-1.5M	Sep 23, 2019		Soil	B19-Se41569	X		
85	BH044 - 1.5-1.75M	Sep 23, 2019		Soil	B19-Se41570	X		
86	BH044 - 1.75-2.0M	Sep 23, 2019		Soil	B19-Se41571	X	X	X
87	BH044 - 2.0-2.25M	Sep 23, 2019		Soil	B19-Se41572	X		
88	BH044 - 2.25-2.5M	Sep 23, 2019		Soil	B19-Se41573	X		
89	BH044 - 2.5-2.75M	Sep 23, 2019		Soil	B19-Se41574	X		
90	BH044 - 2.75-	Sep 23, 2019		Soil	B19-Se41575	X	X	X

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Project ID: 19210	Fax:	Contact Name: Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	3.0M							
91	BH044 - 3.0-3.25M	Sep 23, 2019		Soil	B19-Se41576	X		
92	BH044 - 3.25-3.5M	Sep 23, 2019		Soil	B19-Se41577	X		
Test Counts						92	23	23

Internal Quality Control Review and Glossary
General

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

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery										
Chromium Suite (SKCI)										
Chromium Reducible Sulfur				%	99			70-130	Pass	
Acid Neutralising Capacity (ANCbt)				%	96			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD		Acceptance Limits	Pass Limits	Qualifying Code
Duplicate										
					Result 1	Result 2	RPD			
% Moisture	B19-Se42800	NCP	%	20	16	19		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test					Result 1	Result 2	RPD			
pH-F (Field pH test)*	B19-Se41489	CP	pH Units	5.1	5.2	pass		30%	Pass	
Reaction Ratings*	B19-Se41489	CP	comment	2.0	2.0	pass		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test					Result 1	Result 2	RPD			
pH-F (Field pH test)*	B19-Se41499	CP	pH Units	5.7	5.6	pass		30%	Pass	
Reaction Ratings*	B19-Se41499	CP	comment	3.0	3.0	pass		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test					Result 1	Result 2	RPD			
pH-F (Field pH test)*	B19-Se41509	CP	pH Units	5.1	5.2	pass		30%	Pass	
Reaction Ratings*	B19-Se41509	CP	comment	4.0	4.0	pass		30%	Pass	
Duplicate										
Chromium Suite (SKCI)					Result 1	Result 2	RPD			
pH-KCL	B19-Se41518	CP	pH Units	4.5	4.5	<1		30%	Pass	
Acid trail - Titratable Actual Acidity	B19-Se41518	CP	mol H+/t	17	16	3.6		30%	Pass	
sulfidic - TAA equiv. S% pyrite	B19-Se41518	CP	% pyrite S	0.030	0.030	4.0		30%	Pass	
Chromium Reducible Sulfur	B19-Se41518	CP	% S	< 0.005	< 0.005	<1		30%	Pass	
Chromium Reducible Sulfur -acidity units	B19-Se41518	CP	mol H+/t	< 3	< 3	<1		30%	Pass	
Sulfur - KCl Extractable	B19-Se41518	CP	% S	0.03	0.03	4.0		30%	Pass	
Net Acid soluble sulfur	B19-Se41518	CP	% S	n/a	n/a	n/a		30%	Pass	
Net Acid soluble sulfur - acidity units	B19-Se41518	CP	mol H+/t	n/a	n/a	n/a		30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	B19-Se41518	CP	% S	n/a	n/a	n/a		30%	Pass	
Acid Neutralising Capacity (ANCbt)	B19-Se41518	CP	% CaCO ₃	n/a	n/a	n/a		30%	Pass	
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	B19-Se41518	CP	% S	n/a	n/a	n/a		30%	Pass	
ANC Fineness Factor	B19-Se41518	CP	factor	1.5	1.5	<1		30%	Pass	
CRS Suite - Net Acidity (Sulfur Units)	B19-Se41518	CP	% S	0.03	0.03	n/a		30%	Pass	
CRS Suite - Net Acidity (Acidity Units)	B19-Se41518	CP	mol H+/t	17	16	n/a		30%	Pass	
CRS Suite - Liming Rate	B19-Se41518	CP	kg CaCO ₃ /t	1.3	1.2	4.0		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test					Result 1	Result 2	RPD			
pH-F (Field pH test)*	B19-Se41519	CP	pH Units	5.5	5.4	pass		30%	Pass	
Reaction Ratings*	B19-Se41519	CP	comment	1.0	1.0	pass		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test					Result 1	Result 2	RPD			
pH-F (Field pH test)*	B19-Se41539	CP	pH Units	6.5	6.3	pass		30%	Pass	
Reaction Ratings*	B19-Se41539	CP	comment	2.0	2.0	pass		30%	Pass	

Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se41549	CP	pH Units	8.2	8.0	pass	30%	Pass
Reaction Ratings*	B19-Se41549	CP	comment	4.0	4.0	pass	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se41559	CP	pH Units	8.1	8.0	pass	30%	Pass
Reaction Ratings*	B19-Se41559	CP	comment	4.0	4.0	pass	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se41561	CP	pH Units	8.5	8.4	pass	30%	Pass
Reaction Ratings*	B19-Se41561	CP	comment	4.0	4.0	pass	30%	Pass
Duplicate								
Chromium Suite (SKCI)				Result 1	Result 2	RPD		
pH-KCL	B19-Se41561	CP	pH Units	6.5	6.5	<1	30%	Pass
Acid trail - Titratable Actual Acidity	B19-Se41561	CP	mol H+/t	< 2	< 2	<1	30%	Pass
sulfidic - TAA equiv. S% pyrite	B19-Se41561	CP	% pyrite S	< 0.003	< 0.003	<1	30%	Pass
Chromium Reducible Sulfur	B19-Se41561	CP	% S	< 0.005	< 0.005	<1	30%	Pass
Chromium Reducible Sulfur -acidity units	B19-Se41561	CP	mol H+/t	< 3	< 3	<1	30%	Pass
Sulfur - KCl Extractable	B19-Se41561	CP	% S	< 0.02	< 0.02	<1	30%	Pass
Net Acid soluble sulfur	B19-Se41561	CP	% S	n/a	n/a	n/a	30%	Pass
Net Acid soluble sulfur - acidity units	B19-Se41561	CP	mol H+/t	n/a	n/a	n/a	30%	Pass
Net Acid soluble sulfur - equivalent S% pyrite	B19-Se41561	CP	% S	n/a	n/a	n/a	30%	Pass
Acid Neutralising Capacity (ANCbt)	B19-Se41561	CP	% CaCO ₃	n/a	n/a	n/a	30%	Pass
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	B19-Se41561	CP	% S	n/a	n/a	n/a	30%	Pass
ANC Fineness Factor	B19-Se41561	CP	factor	1.5	1.5	<1	30%	Pass
CRS Suite - Net Acidity (Sulfur Units)	B19-Se41561	CP	% S	< 0.02	< 0.02	<1	30%	Pass
CRS Suite - Net Acidity (Acidity Units)	B19-Se41561	CP	mol H+/t	< 10	< 10	<1	30%	Pass
CRS Suite - Liming Rate	B19-Se41561	CP	kg CaCO ₃ /t	< 1	< 1	<1	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se41562	CP	pH Units	8.3	8.3	pass	30%	Pass
Reaction Ratings*	B19-Se41562	CP	comment	4.0	4.0	pass	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se41563	CP	pH Units	8.3	8.2	pass	30%	Pass
Reaction Ratings*	B19-Se41563	CP	comment	4.0	4.0	pass	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se41564	CP	pH Units	6.5	6.5	pass	30%	Pass
Reaction Ratings*	B19-Se41564	CP	comment	4.0	4.0	pass	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se41575	CP	pH Units	8.2	8.3	pass	30%	Pass
Reaction Ratings*	B19-Se41575	CP	comment	4.0	4.0	pass	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se41577	CP	pH Units	8.5	8.6	pass	30%	Pass
Reaction Ratings*	B19-Se41577	CP	comment	1.0	1.0	pass	30%	Pass

Comments
Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
Sample correctly preserved	No
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
S01	Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO3) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from 'kg/t dry weight' to 'kg/m3 in-situ soil' multiply 'reported results' x 'wet bulk density of soil in t/m3'
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5
S03	Acid Neutralising Capacity is only required if the pHKCl is 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
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised By

Ryan Gilbert	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](#).

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 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: **Mark Thomson**

Report **679662-S**
 Project name **MIBA- NORTH HARBOUR**
 Project ID **19210**
 Received Date **Sep 27, 2019**

Client Sample ID			BH46_0.0-0.25M	BH46_0.25-0.5M	BH46_0.5-0.75M	BH46_0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42991	B19-Se42992	B19-Se42993	B19-Se42994
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.6	-	6.6	6.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.8	-	4.5	4.9
Reaction Ratings* ^{S05}		comment	2.0	-	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	5.2	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	14	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.020	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	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	-	0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	14	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	1.1	-	-
<2mm Fraction	0.005	g	-	62	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	9.9	-	-

Client Sample ID			BH46_1.00-1.25M	BH46_1.25-1.5M	BH46_1.5-1.75M	BH46_1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42995	B19-Se42996	B19-Se42997	B19-Se42998
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.4	7.4	-	7.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	6.1	7.7	-	7.9
Reaction Ratings* ^{S05}		comment	4.0	4.0	-	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	5.9	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	6.8	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.010	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	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	-	-	< 0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	< 10	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	< 1	-
<2mm Fraction	0.005	g	-	-	87	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture	1	%	-	-	15	-

Client Sample ID			BH46_2.0-2.25M	BH46_2.25-2.5M	BH46_2.5-2.75M	BH46_2.75-3.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42999	B19-Se43000	B19-Se43001	B19-Se43002
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.0	8.2	8.0	-
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.0	7.7	7.8	-
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	-
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	6.2
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	4.0
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.010
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0

Client Sample ID			BH46_2.0-2.25M	BH46_2.25-2.5M	BH46_2.5-2.75M	BH46_2.75-3.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42999	B19-Se43000	B19-Se43001	B19-Se43002
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	-	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	-	-	-	< 0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	< 10
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	-	< 1
<2mm Fraction	0.005	g	-	-	-	86
>2mm Fraction	0.005	g	-	-	-	5.3
Analysed Material	0.1	%	-	-	-	94
Extraneous Material	0.1	%	-	-	-	5.8
% Moisture	1	%	-	-	-	15

Client Sample ID			BH46_3.0-3.25M	BH46_3.25-3.5M	BH47_0.0-0.25M	BH47_0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se43003	B19-Se43004	B19-Se43005	B19-Se43006
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.7	8.8	-	6.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.4	8.4	-	5.7
Reaction Ratings ^{S05}		comment	2.0	4.0	-	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	5.3	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	17	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.030	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	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	-	-	0.03	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	17	-

Client Sample ID			BH46_3.0-3.25M	BH46_3.25-3.5M	BH47_0.0-0.25M	BH47_0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se43003	B19-Se43004	B19-Se43005	B19-Se43006
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	1.3	-
<2mm Fraction	0.005	g	-	-	53	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture						
	1	%	-	-	11	-

Client Sample ID			BH47_0.5-0.75M	BH47_0.75-1.00M	BH47_1.00-1.25M	BH47_1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se43007	B19-Se43008	B19-Se43009	B19-Se43010
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.2	7.4	-	8.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.7	5.8	-	7.9
Reaction Ratings* ^{S05}		comment	4.0	4.0	-	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	6.1	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	6.1	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.010	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	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	-	-	< 0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	< 10	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	< 1	-
<2mm Fraction	0.005	g	-	-	74	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture						
	1	%	-	-	19	-

Client Sample ID			BH47_1.5-1.75M	BH47_1.75-2.0M	BH47_2.0-2.25M	BH47_2.25-2.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se43011	B19-Se43012	B19-Se43013	B19-Se43014
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.1	8.1	-	7.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.3	8.4	-	8.3
Reaction Ratings* ^{S05}		comment	4.0	4.0	-	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	6.0	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	6.9	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.010	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	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	-	-	< 0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	< 10	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	< 1	-
<2mm Fraction	0.005	g	-	-	82	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture	1	%	-	-	18	-

Client Sample ID			BH47_2.5-2.75M	BH47_2.75-3.0M	BH47_3.0-3.25M	BH47_3.25-3.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se43015	B19-Se43016	B19-Se43017	B19-Se43018
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.7	7.8	7.6	-
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.1	8.2	8.2	-
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	-
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	5.8
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	6.9
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.010
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0

Client Sample ID			BH47_2.5-2.75M	BH47_2.75-3.0M	BH47_3.0-3.25M	BH47_3.25-3.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se43015	B19-Se43016	B19-Se43017	B19-Se43018
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	-	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	-	-	-	< 0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	< 10
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	-	< 1
<2mm Fraction	0.005	g	-	-	-	79
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture	1	%	-	-	-	17

Client Sample ID			BH67_0.0-0.25M	BH67_0.25-0.5M	BH67_0.5-0.75M	BH67_0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se43019	B19-Se43020	B19-Se43021	B19-Se43022
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	-	4.7	4.9	-
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	-	3.2	3.8	-
Reaction Ratings ^{S05}		comment	-	4.0	4.0	-
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.9	-	-	3.9
Acid trail - Titratable Actual Acidity	2	mol H+/t	23	-	-	19
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.040	-	-	0.030
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	-	< 3
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	2.0
HCl Extractable Sulfur	0.02	% S	n/a	-	-	< 0.02
Net Acid soluble sulfur	0.02	% S	n/a	-	-	< 0.02
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	< 10
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	< 0.02
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	n/a	-	-	n/a
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	n/a	-	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	-	n/a
ANC Fineness Factor		factor	1.5	-	-	1.5
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	0.04	-	-	0.03
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	23	-	-	19

Client Sample ID			BH67_0.0-0.25M	BH67_0.25-0.5M	BH67_0.5-0.75M	BH67_0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se43019	B19-Se43020	B19-Se43021	B19-Se43022
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	1.7	-	-	1.4
<2mm Fraction	0.005	g	73	-	-	130
>2mm Fraction	0.005	g	< 0.005	-	-	< 0.005
Analysed Material	0.1	%	100	-	-	100
Extraneous Material	0.1	%	< 0.1	-	-	< 0.1
% Moisture	1	%	6.9	-	-	22

Client Sample ID			BH67_1.00-1.25M	BH67_1.25-1.5M	BH67_1.5-1.75M	BH67_1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se43023	B19-Se43024	B19-Se43025	B19-Se43026
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.3	5.5	5.7	5.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.9	4.7	4.9	4.9
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0

Client Sample ID			BH68_0.0-0.25M	BH68_0.25-0.5M	BH68_0.5-0.75M	BH68_0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se43027	B19-Se43028	B19-Se43029	B19-Se43030
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.5	-	5.1	5.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.4	-	4.6	4.4
Reaction Ratings* ^{S05}		comment	4.0	-	4.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.5	-	-
Acid trail - Titratable Actual Acidity	2	mol H ⁺ /t	-	49	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.080	-	-
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	-	0.03	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H ⁺ /t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	0.08	-	-

Client Sample ID			BH68_0.0-0.25M	BH68_0.25-0.5M	BH68_0.5-0.75M	BH68_0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se43027	B19-Se43028	B19-Se43029	B19-Se43030
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	49	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	3.7	-	-
<2mm Fraction	0.005	g	-	72	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	1	%	-	12	-	-

Client Sample ID			BH68_1.00-1.25M	BH68_1.25-1.5M	BH68_1.5-1.75M	BH68_1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se43031	B19-Se43032	B19-Se43033	B19-Se43034
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.2	-	5.5	5.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.4	-	4.7	4.9
Reaction Ratings* ^{S05}		comment	4.0	-	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.6	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	22	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.030	-	-
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	-	0.06	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	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	-	0.03	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	22	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	1.6	-	-
<2mm Fraction	0.005	g	-	98	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	1	%	-	25	-	-

Client Sample ID			BH69_0.0-0.25M	BH69_0.25-0.5M	BH69_0.5-0.75M	BH69_0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se43035	B19-Se43036	B19-Se43037	B19-Se43038
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	-	5.9	5.0	-
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	-	4.4	4.3	-
Reaction Ratings**S05		comment	-	4.0	2.0	-
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.5	-	-	4.3
Acid trail - Titratable Actual Acidity	2	mol H+/t	51	-	-	42
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.080	-	-	0.070
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	-	< 3
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	-	0.07
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	2.0
HCl Extractable Sulfur	0.02	% S	n/a	-	-	0.14
Net Acid soluble sulfur	0.02	% S	n/a	-	-	0.07
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	34
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	0.05
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	n/a	-	-	n/a
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	n/a	-	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	-	n/a
ANC Fineness Factor		factor	1.5	-	-	1.5
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	0.08	-	-	0.12
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	51	-	-	76
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	3.8	-	-	5.7
<2mm Fraction	0.005	g	59	-	-	100
>2mm Fraction	0.005	g	< 0.005	-	-	< 0.005
Analysed Material	0.1	%	100	-	-	100
Extraneous Material	0.1	%	< 0.1	-	-	< 0.1
% Moisture	1	%	16	-	-	17

Client Sample ID			BH69_1.00-1.25M	BH69_1.25-1.5M	BH69_1.5-1.75M	BH69_1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se43039	B19-Se43040	B19-Se43041	B19-Se43042
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.9	5.0	5.2	5.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.1	4.2	4.0	4.3
Reaction Ratings**S05		comment	1.0	1.0	1.0	1.0

Client Sample ID			BH76_0.0-0.25M	BH76_0.25-0.5M	BH76_0.5-0.75M	BH76_0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se43043	B19-Se43044	B19-Se43045	B19-Se43046
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.1	-	5.7	5.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.7	-	5.0	4.8
Reaction Ratings**S05		comment	3.0	-	1.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	5.1	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	14	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.020	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	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	-	0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	14	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	1.1	-	-
<2mm Fraction	0.005	g	-	51	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	6.8	-	-

Client Sample ID			BH76_1.00-1.25M	BH76_1.25-1.5M	BH76_1.5-1.75M	BH76_1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se43047	B19-Se43048	B19-Se43049	B19-Se43050
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.7	-	6.0	6.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.9	-	5.0	5.0
Reaction Ratings**S05		comment	2.0	-	1.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	5.3	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	15	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.020	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-

Client Sample ID			BH76_1.00-1.25M	BH76_1.25-1.5M	BH76_1.5-1.75M	BH76_1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se43047	B19-Se43048	B19-Se43049	B19-Se43050
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	15	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	1.2	-	-
<2mm Fraction	0.005	g	-	69	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	16	-	-

Client Sample ID			BH77_0.0-0.25M	BH77_0.25-0.5M	BH77_0.5-0.75M	BH77_0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se43051	B19-Se43052	B19-Se43053	B19-Se43054
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.8	5.8	-	5.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.6	4.2	-	4.2
Reaction Ratings ^{S05}		comment	4.0	4.0	-	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	4.5	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	34	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.050	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	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	-	-	0.05	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	34	-

Client Sample ID			BH77_0.0-0.25M	BH77_0.25-0.5M	BH77_0.5-0.75M	BH77_0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se43051	B19-Se43052	B19-Se43053	B19-Se43054
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	2.6	-
<2mm Fraction	0.005	g	-	-	72	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture						
	1	%	-	-	15	-

Client Sample ID			BH77_1.00-1.25M	BH77_1.25-1.5M	BH77_1.5-1.75M	BH77_1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se43055	B19-Se43056	B19-Se43057	B19-Se43058
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.3	5.5	5.8	-
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.3	4.5	4.8	-
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	-
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	5.1
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	11
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.020
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	-	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	-	-	-	0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	11
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	< 1
<2mm Fraction	0.005	g	-	-	-	65
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture						
	1	%	-	-	-	20

Client Sample ID			BH78_0.0-0.25M	BH78_0.25-0.5M	BH78_0.5-0.75M	BH78_0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se43059	B19-Se43060	B19-Se43061	B19-Se43062
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	-	5.0	-	4.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	-	3.8	-	3.9
Reaction Ratings**S05		comment	-	2.0	-	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.3	-	4.1	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	77	-	70	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.12	-	0.11	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	< 0.005	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	< 3	-
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	2.0	-
HCl Extractable Sulfur	0.02	% S	< 0.02	-	0.03	-
Net Acid soluble sulfur	0.02	% S	< 0.02	-	0.03	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	< 10	-	13	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	< 0.02	-	0.02	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	n/a	-	n/a	-
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	n/a	-	n/a	-
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	n/a	-
ANC Fineness Factor		factor	1.5	-	1.5	-
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	0.12	-	0.13	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	77	-	83	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	5.7	-	6.2	-
<2mm Fraction	0.005	g	48	-	88	-
>2mm Fraction	0.005	g	< 0.005	-	< 0.005	-
Analysed Material	0.1	%	100	-	100	-
Extraneous Material	0.1	%	< 0.1	-	< 0.1	-
% Moisture	1	%	16	-	21	-

Client Sample ID			BH78_1.00-1.25M	BH78_1.25-1.5M	BH78_1.5-1.75M	BH78_1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se43063	B19-Se43064	B19-Se43065	B19-Se43066
Date Sampled			Sep 23, 2019	Sep 23, 2019	Sep 23, 2019	Sep 23, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.8	4.7	4.9	5.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.0	4.0	4.4	4.5
Reaction Ratings**S05		comment	2.0	2.0	2.0	2.0

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

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 - Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests	Brisbane	Sep 30, 2019	7 Days
Chromium Suite (SKCI) - Method: LTM-GEN-7070	Brisbane	Sep 30, 2019	6 Week
% Moisture - Method: LTM-GEN-7080 Moisture	Brisbane	Sep 30, 2019	14 Days

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 27, 2019 9:00 AM
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Project Name:	MIBA- NORTH HARBOUR	Phone:	07 5478 9642	Priority:	7 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	BH46_0.0-0.25M	Sep 23, 2019		Soil	B19-Se42991	X		
2	BH46_0.25-0.5M	Sep 23, 2019		Soil	B19-Se42992		X	X
3	BH46_0.5-0.75M	Sep 23, 2019		Soil	B19-Se42993	X		
4	BH46_0.75-1.00M	Sep 23, 2019		Soil	B19-Se42994	X		
5	BH46_1.00-1.25M	Sep 23, 2019		Soil	B19-Se42995	X		
6	BH46_1.25-	Sep 23, 2019		Soil	B19-Se42996	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
7	BH46_1.5-1.75M	Sep 23, 2019		Soil	B19-Se42997		X	X
8	BH46_1.75-2.0M	Sep 23, 2019		Soil	B19-Se42998	X		
9	BH46_2.0-2.25M	Sep 23, 2019		Soil	B19-Se42999	X		
10	BH46_2.25-2.5M	Sep 23, 2019		Soil	B19-Se43000	X		
11	BH46_2.5-2.75M	Sep 23, 2019		Soil	B19-Se43001	X		
12	BH46_2.75-3.0M	Sep 23, 2019		Soil	B19-Se43002		X	X
13	BH46_3.0-	Sep 23, 2019		Soil	B19-Se43003	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	3.25M							
14	BH46_3.25-3.5M	Sep 23, 2019		Soil	B19-Se43004	X		
15	BH47_0.0-0.25M	Sep 23, 2019		Soil	B19-Se43005		X	X
16	BH47_0.25-0.5M	Sep 23, 2019		Soil	B19-Se43006	X		
17	BH47_0.5-0.75M	Sep 23, 2019		Soil	B19-Se43007	X		
18	BH47_0.75-1.00M	Sep 23, 2019		Soil	B19-Se43008	X		
19	BH47_1.00-1.25M	Sep 23, 2019		Soil	B19-Se43009		X	X
20	BH47_1.25-	Sep 23, 2019		Soil	B19-Se43010	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
21	BH47_1.5-1.75M	Sep 23, 2019		Soil	B19-Se43011	X		
22	BH47_1.75-2.0M	Sep 23, 2019		Soil	B19-Se43012	X		
23	BH47_2.0-2.25M	Sep 23, 2019		Soil	B19-Se43013		X	X
24	BH47_2.25-2.5M	Sep 23, 2019		Soil	B19-Se43014	X		
25	BH47_2.5-2.75M	Sep 23, 2019		Soil	B19-Se43015	X		
26	BH47_2.75-3.0M	Sep 23, 2019		Soil	B19-Se43016	X		
27	BH47_3.0-	Sep 23, 2019		Soil	B19-Se43017	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	3.25M							
28	BH47_3.25-3.5M	Sep 23, 2019		Soil	B19-Se43018		X X	
29	BH67_0.0-0.25M	Sep 23, 2019		Soil	B19-Se43019		X X	
30	BH67_0.25-0.5M	Sep 23, 2019		Soil	B19-Se43020	X		
31	BH67_0.5-0.75M	Sep 23, 2019		Soil	B19-Se43021	X		
32	BH67_0.75-1.00M	Sep 23, 2019		Soil	B19-Se43022		X X	
33	BH67_1.00-1.25M	Sep 23, 2019		Soil	B19-Se43023	X		
34	BH67_1.25-	Sep 23, 2019		Soil	B19-Se43024	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson
Eurofins Analytical Services Manager : Ryan Gilbert					

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
35	BH67_1.5-1.75M	Sep 23, 2019		Soil	B19-Se43025	X		
36	BH67_1.75-2.0M	Sep 23, 2019		Soil	B19-Se43026	X		
37	BH68_0.0-0.25M	Sep 23, 2019		Soil	B19-Se43027	X		
38	BH68_0.25-0.5M	Sep 23, 2019		Soil	B19-Se43028		X	X
39	BH68_0.5-0.75M	Sep 23, 2019		Soil	B19-Se43029	X		
40	BH68_0.75-1.00M	Sep 23, 2019		Soil	B19-Se43030	X		
41	BH68_1.00-	Sep 23, 2019		Soil	B19-Se43031	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.25M							
42	BH68_1.25-1.5M	Sep 23, 2019		Soil	B19-Se43032		X	X
43	BH68_1.5-1.75M	Sep 23, 2019		Soil	B19-Se43033	X		
44	BH68_1.75-2.0M	Sep 23, 2019		Soil	B19-Se43034	X		
45	BH69_0.0-0.25M	Sep 23, 2019		Soil	B19-Se43035		X	X
46	BH69_0.25-0.5M	Sep 23, 2019		Soil	B19-Se43036	X		
47	BH69_0.5-0.75M	Sep 23, 2019		Soil	B19-Se43037	X		
48	BH69_0.75-	Sep 23, 2019		Soil	B19-Se43038		X	X

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Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.00M							
49	BH69_1.00-1.25M	Sep 23, 2019		Soil	B19-Se43039	X		
50	BH69_1.25-1.5M	Sep 23, 2019		Soil	B19-Se43040	X		
51	BH69_1.5-1.75M	Sep 23, 2019		Soil	B19-Se43041	X		
52	BH69_1.75-2.0M	Sep 23, 2019		Soil	B19-Se43042	X		
53	BH76_0.0-0.25M	Sep 23, 2019		Soil	B19-Se43043	X		
54	BH76_0.25-0.5M	Sep 23, 2019		Soil	B19-Se43044		X	X
55	BH76_0.5-	Sep 23, 2019		Soil	B19-Se43045	X		

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 27, 2019 9:00 AM
Address:	40A Glen Vista Place Chevalum Qld 4555	Report #:	679662	Due:	Oct 9, 2019
Project Name:	MIBA- NORTH HARBOUR	Phone:	07 5478 9642	Priority:	7 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson
Eurofins Analytical Services Manager : Ryan Gilbert					

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	0.75M							
56	BH76_0.75-1.00M	Sep 23, 2019		Soil	B19-Se43046	X		
57	BH76_1.00-1.25M	Sep 23, 2019		Soil	B19-Se43047	X		
58	BH76_1.25-1.5M	Sep 23, 2019		Soil	B19-Se43048		X	X
59	BH76_1.5-1.75M	Sep 23, 2019		Soil	B19-Se43049	X		
60	BH76_1.75-2.0M	Sep 23, 2019		Soil	B19-Se43050	X		
61	BH77_0.0-0.25M	Sep 23, 2019		Soil	B19-Se43051	X		
62	BH77_0.25-	Sep 23, 2019		Soil	B19-Se43052	X		

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 27, 2019 9:00 AM
Address:	40A Glen Vista Place Chevalum Qld 4555	Report #:	679662	Due:	Oct 9, 2019
Project Name:	MIBA- NORTH HARBOUR	Phone:	07 5478 9642	Priority:	7 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson
Eurofins Analytical Services Manager : Ryan Gilbert					

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	0.5M							
63	BH77_0.5-0.75M	Sep 23, 2019		Soil	B19-Se43053		X	X
64	BH77_0.75-1.00M	Sep 23, 2019		Soil	B19-Se43054	X		
65	BH77_1.00-1.25M	Sep 23, 2019		Soil	B19-Se43055	X		
66	BH77_1.25-1.5M	Sep 23, 2019		Soil	B19-Se43056	X		
67	BH77_1.5-1.75M	Sep 23, 2019		Soil	B19-Se43057	X		
68	BH77_1.75-2.0M	Sep 23, 2019		Soil	B19-Se43058		X	X
69	BH78_0.0-	Sep 23, 2019		Soil	B19-Se43059		X	X

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 27, 2019 9:00 AM
Address:	40A Glen Vista Place Chevalum Qld 4555	Report #:	679662	Due:	Oct 9, 2019
Project Name:	MIBA- NORTH HARBOUR	Phone:	07 5478 9642	Priority:	7 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	0.25M							
70	BH78_0.25-0.5M	Sep 23, 2019		Soil	B19-Se43060	X		
71	BH78_0.5-0.75M	Sep 23, 2019		Soil	B19-Se43061		X	X
72	BH78_0.75-1.00M	Sep 23, 2019		Soil	B19-Se43062	X		
73	BH78_1.00-1.25M	Sep 23, 2019		Soil	B19-Se43063	X		
74	BH78_1.25-1.5M	Sep 23, 2019		Soil	B19-Se43064	X		
75	BH78_1.5-1.75M	Sep 23, 2019		Soil	B19-Se43065	X		
76	BH78_1.75-	Sep 23, 2019		Soil	B19-Se43066	X		

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 27, 2019 9:00 AM
Address:	40A Glen Vista Place Chevalum Qld 4555	Report #:	679662	Due:	Oct 9, 2019
Project Name:	MIBA- NORTH HARBOUR	Phone:	07 5478 9642	Priority:	7 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail					Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794					X	X	X
Perth Laboratory - NATA Site # 23736							
	2.0M						
Test Counts					57	19	19

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.
- 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.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- 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

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

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

QC Data General Comments

- 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.
- 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.
- Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
- 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.
- 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.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
- For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery										
Chromium Suite (SKCI)										
Chromium Reducible Sulfur				%	99			70-130	Pass	
Acid Neutralising Capacity (ANCbt)				%	96			70-130	Pass	
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)*	B19-Se42998	CP	pH Units	7.9	8.0	pass		30%	Pass	
Reaction Ratings*	B19-Se42998	CP	comment	2.0	2.0	pass		30%	Pass	
Duplicate										
					Result 1	Result 2	RPD			
% Moisture	B19-Se43018	CP	%	17	18	5.0		30%	Pass	
Duplicate										
Chromium Suite (SKCI)					Result 1	Result 2	RPD			
pH-KCL	B19-Se43022	CP	pH Units	3.9	3.9	<1		30%	Pass	
Acid trail - Titratable Actual Acidity	B19-Se43022	CP	mol H+/t	19	19	<1		30%	Pass	
sulfidic - TAA equiv. S% pyrite	B19-Se43022	CP	% pyrite S	0.030	0.030	1.0		30%	Pass	
Chromium Reducible Sulfur	B19-Se43022	CP	% S	< 0.005	< 0.005	<1		30%	Pass	
Chromium Reducible Sulfur -acidity units	B19-Se43022	CP	mol H+/t	< 3	< 3	<1		30%	Pass	
Sulfur - KCl Extractable	B19-Se43022	CP	% S	< 0.02	< 0.02	<1		30%	Pass	
Net Acid soluble sulfur	B19-Se43022	CP	% S	< 0.02	< 0.02	<1		30%	Pass	
Net Acid soluble sulfur - acidity units	B19-Se43022	CP	mol H+/t	< 10	< 10	<1		30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	B19-Se43022	CP	% S	< 0.02	< 0.02	<1		30%	Pass	
Acid Neutralising Capacity (ANCbt)	B19-Se43022	CP	% CaCO3	n/a	n/a	n/a		30%	Pass	
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	B19-Se43022	CP	% S	n/a	n/a	n/a		30%	Pass	
ANC Fineness Factor	B19-Se43022	CP	factor	1.5	1.5	<1		30%	Pass	
CRS Suite - Net Acidity (Sulfur Units)	B19-Se43022	CP	% S	0.03	0.03	n/a		30%	Pass	
CRS Suite - Net Acidity (Acidity Units)	B19-Se43022	CP	mol H+/t	19	19	n/a		30%	Pass	
CRS Suite - Liming Rate	B19-Se43022	CP	kg CaCO3/t	1.4	1.4	1.0		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test					Result 1	Result 2	RPD			
pH-F (Field pH test)*	B19-Se43025	CP	pH Units	5.7	5.7	pass		30%	Pass	
Reaction Ratings*	B19-Se43025	CP	comment	4.0	4.0	pass		30%	Pass	
Duplicate										
Chromium Suite (SKCI)					Result 1	Result 2	RPD			
pH-KCL	B19-Se43032	CP	pH Units	4.6	4.6	<1		30%	Pass	
Acid trail - Titratable Actual Acidity	B19-Se43032	CP	mol H+/t	22	22	<1		30%	Pass	
sulfidic - TAA equiv. S% pyrite	B19-Se43032	CP	% pyrite S	0.030	0.030	<1		30%	Pass	
Chromium Reducible Sulfur	B19-Se43032	CP	% S	< 0.005	< 0.005	<1		30%	Pass	
Chromium Reducible Sulfur -acidity units	B19-Se43032	CP	mol H+/t	< 3	< 3	<1		30%	Pass	
Sulfur - KCl Extractable	B19-Se43032	CP	% S	0.06	0.06	3.0		30%	Pass	
Net Acid soluble sulfur	B19-Se43032	CP	% S	n/a	n/a	n/a		30%	Pass	
Net Acid soluble sulfur - acidity units	B19-Se43032	CP	mol H+/t	n/a	n/a	n/a		30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	B19-Se43032	CP	% S	n/a	n/a	n/a		30%	Pass	
Acid Neutralising Capacity (ANCbt)	B19-Se43032	CP	% CaCO3	n/a	n/a	n/a		30%	Pass	

Duplicate								
Chromium Suite (SKCI)				Result 1	Result 2	RPD		
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	B19-Se43032	CP	% S	n/a	n/a	n/a	30%	Pass
ANC Fineness Factor	B19-Se43032	CP	factor	1.5	1.5	<1	30%	Pass
CRS Suite - Net Acidity (Sulfur Units)	B19-Se43032	CP	% S	0.03	0.03	n/a	30%	Pass
CRS Suite - Net Acidity (Acidity Units)	B19-Se43032	CP	mol H+/t	22	22	n/a	30%	Pass
CRS Suite - Liming Rate	B19-Se43032	CP	kg CaCO ₃ /t	1.6	1.6	<1	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se43039	CP	pH Units	4.9	4.8	pass	30%	Pass
Reaction Ratings*	B19-Se43039	CP	comment	1.0	1.0	pass	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se43051	CP	pH Units	5.8	5.8	pass	30%	Pass
Reaction Ratings*	B19-Se43051	CP	comment	4.0	4.0	pass	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	B19-Se43058	CP	%	20	18	7.0	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se43065	CP	pH Units	4.9	5.1	pass	30%	Pass
Reaction Ratings*	B19-Se43065	CP	comment	2.0	2.0	pass	30%	Pass

Comments
Sample Integrity

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

Qualifier Codes/Comments

Code	Description
S01	Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO ₃) 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/m ³ in-situ soil' multiply 'reported results' x 'wet bulk density of soil in t/m ³ '
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5
S03	Acid Neutralising Capacity is only required if the pHKCl is 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
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised By

Ryan Gilbert	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](#).

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Tectonic Geotechnical Pty Ltd
 40A Glen Vista Place
 Chevalum
 Qld 4555



NATA Accredited
 Accreditation Number 1261
 Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: **Mark Thomson**

Report **679658-S**
 Project name **MIBA - NORTH HARBOUR**
 Project ID **19210**
 Received Date **Sep 27, 2019**

Client Sample ID			BH025_0.0-0.25M	BH025_0.25-0.5M	BH025_0.5-0.75M	BH025_0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42799	B19-Se42800	B19-Se42801	B19-Se42802
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.7	-	5.4	5.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.9	-	4.0	4.1
Reaction Ratings* ^{S05}		comment	4.0	-	2.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.1	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	64	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.10	-	-
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	-	0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	0.04	-	-
Net Acid soluble sulfur	0.02	% S	-	< 0.02	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	< 10	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	< 0.02	-	-
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	-	0.10	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	73	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	5.5	-	-
<2mm Fraction	0.005	g	-	89	-	-
>2mm Fraction	0.005	g	-	16	-	-
Analysed Material	0.1	%	-	85	-	-
Extraneous Material	0.1	%	-	15	-	-
% Moisture	1	%	-	20	-	-

Client Sample ID			BH025_1.0-1.25M	BH025_1.25-1.5M	BH025_1.5-1.75M	BH025_1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42803	B19-Se42804	B19-Se42805	B19-Se42806
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.3	-	6.7	5.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.9	-	4.1	5.0
Reaction Ratings* ^{S05}		comment	4.0	-	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.3	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	37	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	0.04	-	-
Net Acid soluble sulfur	0.02	% S	-	0.04	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	18	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	0.03	-	-
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	-	0.09	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	56	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	4.2	-	-
<2mm Fraction	0.005	g	-	29	-	-
>2mm Fraction	0.005	g	-	15	-	-
Analysed Material	0.1	%	-	66	-	-
Extraneous Material	0.1	%	-	34	-	-
% Moisture	1	%	-	27	-	-

Client Sample ID			BH026_0.0-0.25M	BH026_0.25-0.5M	BH026_0.5-0.75M	BH026_0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42807	B19-Se42808	B19-Se42809	B19-Se42810
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	-	6.0	5.6	5.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	-	3.0	3.5	3.9
Reaction Ratings* ^{S05}		comment	-	4.0	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.5	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	52	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.080	-	-	-
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	< 0.02	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-

Client Sample ID			BH026_0.0-0.25M	BH026_0.25-0.5M	BH026_0.5-0.75M	BH026_0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42807	B19-Se42808	B19-Se42809	B19-Se42810
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	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	0.08	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	52	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	3.9	-	-	-
<2mm Fraction	0.005	g	52	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture	1	%	14	-	-	-

Client Sample ID			BH026_1.00-1.25M	BH026_1.25-1.5M	BH026_1.5-1.75M	BH026_1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42811	B19-Se42812	B19-Se42813	B19-Se42814
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.4	-	5.3	5.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.0	-	3.8	4.1
Reaction Ratings ^{S05}		comment	1.0	-	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.0	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	17	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.030	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	0.03	-	-
Net Acid soluble sulfur	0.02	% S	-	0.03	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	13	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	0.02	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	0.05	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	30	-	-

Client Sample ID			BH026_1.00-1.25M	BH026_1.25-1.5M	BH026_1.5-1.75M	BH026_1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42811	B19-Se42812	B19-Se42813	B19-Se42814
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	2.2	-	-
<2mm Fraction	0.005	g	-	59	-	-
>2mm Fraction	0.005	g	-	27	-	-
Analysed Material	0.1	%	-	68	-	-
Extraneous Material	0.1	%	-	32	-	-
% Moisture	1	%	-	24	-	-

Client Sample ID			BH041_0.0-0.25M	BH041_0.25-0.5M	BH041_0.5-0.75M	BH041_0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42815	B19-Se42816	B19-Se42817	B19-Se42818
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	-	6.5	7.1	7.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	-	4.0	5.2	5.8
Reaction Ratings* ^{S05}		comment	-	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.6	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	38	-	-	-
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	< 0.02	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-
HCl Extractable Sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	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	38	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	2.9	-	-	-
<2mm Fraction	0.005	g	45	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture	1	%	9.5	-	-	-

Client Sample ID			BH041_1.00-1.25M	BH041_1.25-1.5M	BH041_1.5-1.75M	BH041_1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42819	B19-Se42820	B19-Se42821	B19-Se42822
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	-	8.1	8.3	7.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	-	7.6	8.0	6.3
Reaction Ratings* ^{S05}		comment	-	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	6.0	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	6.1	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.010	-	-	-
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	< 0.02	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-
HCl Extractable Sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	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	< 0.02	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	< 10	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	< 1	-	-	-
<2mm Fraction	0.005	g	53	-	-	-
>2mm Fraction	0.005	g	6.6	-	-	-
Analysed Material	0.1	%	89	-	-	-
Extraneous Material	0.1	%	11	-	-	-
% Moisture	1	%	17	-	-	-

Client Sample ID			BH041_2.0-2.25M	BH041_2.25-2.5M	BH041_2.5-2.75M	BH041_2.75-3.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42823	B19-Se42824	B19-Se42825	B19-Se42826
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.6	-	8.5	8.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.4	-	7.1	7.1
Reaction Ratings* ^{S05}		comment	4.0	-	4.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	6.2	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	4.0	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.010	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-

Client Sample ID			BH041_2.0-2.25M	BH041_2.25-2.5M	BH041_2.5-2.75M	BH041_2.75-3.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42823	B19-Se42824	B19-Se42825	B19-Se42826
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	< 0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	< 1	-	-
<2mm Fraction	0.005	g	-	62	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	18	-	-

Client Sample ID			BH041_3.0-3.25M	BH041_3.25-3.5M	BH063_0.0-0.25M	BH063_0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42827	B19-Se42828	B19-Se42829	B19-Se42830
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.2	-	5.6	5.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.0	-	2.5	4.2
Reaction Ratings ^{S05}		comment	4.0	-	4.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	6.1	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	4.1	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.010	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	< 0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	-	-

Client Sample ID			BH041_3.0-3.25M	BH041_3.25-3.5M	BH063_0.0-0.25M	BH063_0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42827	B19-Se42828	B19-Se42829	B19-Se42830
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	< 1	-	-
<2mm Fraction	0.005	g	-	80	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	1	%	-	15	-	-

Client Sample ID			BH063_0.5-0.75M	BH063_0.75-1.0M	BH063_1.0-1.25M	BH063_1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42831	B19-Se42832	B19-Se42833	B19-Se42834
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	-	5.4	5.6	5.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	-	4.7	5.0	5.1
Reaction Ratings* ^{S05}		comment	-	1.0	1.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.5	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	31	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.050	-	-	-
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	< 0.02	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-
HCl Extractable Sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	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	0.05	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	31	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	2.4	-	-	-
<2mm Fraction	0.005	g	62	-	-	-
>2mm Fraction	0.005	g	3.6	-	-	-
Analysed Material	0.1	%	94	-	-	-
Extraneous Material	0.1	%	5.5	-	-	-
% Moisture						
	1	%	12	-	-	-

Client Sample ID			BH063_1.5-1.75M	BH063_1.75-2.0M	BH064_0.0-0.25M	BH064_0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42835	B19-Se42836	B19-Se42837	B19-Se42838
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.2	-	-	5.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.6	-	-	4.3
Reaction Ratings* ^{S05}		comment	1.0	-	-	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.7	5.2	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	20	11	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.030	0.020	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	< 0.005	< 0.005	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	< 3	< 3	-
Sulfur - KCl Extractable	0.02	% S	-	< 0.02	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	2.0	-
HCl Extractable Sulfur	0.02	% S	-	n/a	n/a	-
Net Acid soluble sulfur	0.02	% S	-	n/a	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	n/a	n/a	-
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	-	n/a	n/a	-
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	-	n/a	n/a	-
ANC Fineness Factor		factor	-	1.5	1.5	-
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	-	0.03	0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	20	11	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	1.5	< 1	-
<2mm Fraction	0.005	g	-	36	49	-
>2mm Fraction	0.005	g	-	< 0.005	< 0.005	-
Analysed Material	0.1	%	-	100	100	-
Extraneous Material	0.1	%	-	< 0.1	< 0.1	-
% Moisture	1	%	-	23	5.9	-

Client Sample ID			BH064_0.5-0.75M	BH064_0.75-1.00M	BH064_1.00-1.25M	BH064_1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42839	B19-Se42840	B19-Se42841	B19-Se42842
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.6	-	5.8	5.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.5	-	4.7	4.6
Reaction Ratings* ^{S05}		comment	4.0	-	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	5.2	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	11	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.020	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-

Client Sample ID			BH064_0.5-0.75M	BH064_0.75-1.00M	BH064_1.00-1.25M	BH064_1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42839	B19-Se42840	B19-Se42841	B19-Se42842
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	11	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	< 1	-	-
<2mm Fraction	0.005	g	-	84	-	-
>2mm Fraction	0.005	g	-	11	-	-
Analysed Material	0.1	%	-	88	-	-
Extraneous Material	0.1	%	-	12	-	-
% Moisture	1	%	-	12	-	-

Client Sample ID			BH064_1.5-1.75M	BH064_1.75-2.0M	BH065_0.0-0.25M	BH065_0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42843	B19-Se42844	B19-Se42845	B19-Se42846
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.8	5.9	5.4	5.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.5	4.6	2.6	2.8
Reaction Ratings ^{S05}		comment	2.0	1.0	4.0	4.0

Client Sample ID			BH065_0.5-0.75M	BH065_0.75-1.00M	BH065_1.00-1.25M	BH065_1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42847	B19-Se42848	B19-Se42849	B19-Se42850
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.4	-	5.9	5.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.9	-	4.7	4.8
Reaction Ratings ^{S05}		comment	4.0	-	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.3	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	40	-	-
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	-	< 0.02	-	-

Client Sample ID			BH065_0.5-0.75M	BH065_0.75-1.00M	BH065_1.00-1.25M	BH065_1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42847	B19-Se42848	B19-Se42849	B19-Se42850
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	< 0.02	-	-
Net Acid soluble sulfur	0.02	% S	-	< 0.02	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	< 10	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	< 0.02	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	44	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	3.3	-	-
<2mm Fraction	0.005	g	-	84	-	-
>2mm Fraction	0.005	g	-	1.2	-	-
Analysed Material	0.1	%	-	99	-	-
Extraneous Material	0.1	%	-	1.4	-	-
% Moisture	1	%	-	14	-	-

Client Sample ID			BH065_1.5-1.75M	BH065_1.75-2.0M	BH066_0.0-0.25M	BH066_0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42851	B19-Se42852	B19-Se42853	B19-Se42854
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.9	-	5.4	5.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.9	-	3.9	3.6
Reaction Ratings ^{*S05}		comment	1.0	-	3.0	3.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.5	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	33	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.050	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	0.02	-	-
Net Acid soluble sulfur	0.02	% S	-	0.02	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	< 10	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	< 0.02	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	0.05	-	-

Client Sample ID			BH065_1.5-1.75M	BH065_1.75-2.0M	BH066_0.0-0.25M	BH066_0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42851	B19-Se42852	B19-Se42853	B19-Se42854
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	43	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	3.2	-	-
<2mm Fraction	0.005	g	-	40	-	-
>2mm Fraction	0.005	g	-	21	-	-
Analysed Material	0.1	%	-	65	-	-
Extraneous Material	0.1	%	-	35	-	-
% Moisture						
	1	%	-	18	-	-

Client Sample ID			BH066_0.5-0.75M	BH066_0.75-1.00M	BH066_1.00-1.25M	BH066_1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42855	B19-Se42856	B19-Se42857	B19-Se42858
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	-	5.2	5.2	5.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	-	3.6	3.7	3.9
Reaction Ratings* ^{S05}		comment	-	4.0	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.2	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	130	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.20	-	-	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	0.025	-	-	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	16	-	-	-
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-
HCl Extractable Sulfur	0.02	% S	0.03	-	-	-
Net Acid soluble sulfur	0.02	% S	0.03	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	12	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	< 0.02	-	-	-
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	0.23	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	150	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	12	-	-	-
<2mm Fraction	0.005	g	35	-	-	-
>2mm Fraction	0.005	g	21	-	-	-
Analysed Material	0.1	%	63	-	-	-
Extraneous Material	0.1	%	37	-	-	-
% Moisture						
	1	%	29	-	-	-

Client Sample ID			BH066_1.5-1.75M	BH066_1.75-2.0M	BH083_0.0-0.25M	BH083_0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42859	B19-Se42860	B19-Se42861	B19-Se42862
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	-	5.0	5.7	-
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	-	4.1	2.6	-
Reaction Ratings* ^{S05}		comment	-	1.0	3.0	-
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.3	-	-	4.1
Acid trail - Titratable Actual Acidity	2	mol H+/t	44	-	-	98
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.070	-	-	0.16
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	-	< 3
Sulfur - KCl Extractable	0.02	% S	0.02	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	2.0
HCl Extractable Sulfur	0.02	% S	0.04	-	-	< 0.02
Net Acid soluble sulfur	0.02	% S	0.02	-	-	< 0.02
Net Acid soluble sulfur - acidity units	10	mol H+/t	11	-	-	< 10
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	< 0.02	-	-	< 0.02
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	n/a	-	-	n/a
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	n/a	-	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	-	n/a
ANC Fineness Factor		factor	1.5	-	-	1.5
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	0.07	-	-	0.16
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	55	-	-	98
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	4.1	-	-	7.3
<2mm Fraction	0.005	g	100	-	-	85
>2mm Fraction	0.005	g	< 0.005	-	-	< 0.005
Analysed Material	0.1	%	100	-	-	100
Extraneous Material	0.1	%	< 0.1	-	-	< 0.1
% Moisture	1	%	18	-	-	15

Client Sample ID			BH083_0.5-0.75M	BH083_0.75-1.00M	BH083_1.00-1.25M	BH083_1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42863	B19-Se42864	B19-Se42865	B19-Se42866
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.0	4.9	4.8	-
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.1	4.2	4.3	-
Reaction Ratings* ^{S05}		comment	2.0	2.0	1.0	-
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	4.1
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	88
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.14
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0

Client Sample ID			BH083_0.5-0.75M	BH083_0.75-1.00M	BH083_1.00-1.25M	BH083_1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42863	B19-Se42864	B19-Se42865	B19-Se42866
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	-	-	0.05
Net Acid soluble sulfur	0.02	% S	-	-	-	0.05
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	23
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	0.04
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	-	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	-	-	-	0.18
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	110
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	-	8.3
<2mm Fraction	0.005	g	-	-	-	42
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture	1	%	-	-	-	23

Client Sample ID			BH083_1.5-1.75M	BH083_1.75-2.0M	BH084_0.0-0.25M	BH084_0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42867	B19-Se42868	B19-Se42869	B19-Se42870
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.1	5.0	-	5.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.6	4.5	-	4.5
Reaction Ratings ^{S05}		comment	1.0	1.0	-	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	4.5	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	46	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.070	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	< 0.02	-
Net Acid soluble sulfur	0.02	% S	-	-	< 0.02	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	< 10	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	< 0.02	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	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	-	-	0.07	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	46	-

Client Sample ID			BH083_1.5-1.75M	BH083_1.75-2.0M	BH084_0.0-0.25M	BH084_0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42867	B19-Se42868	B19-Se42869	B19-Se42870
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	3.5	-
<2mm Fraction	0.005	g	-	-	59	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture						
	1	%	-	-	8.5	-

Client Sample ID			BH084_0.5-0.75M	BH084_0.75-1.00M	BH084_1.00-1.25M	BH084_1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42871	B19-Se42872	B19-Se42873	B19-Se42874
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.1	-	4.8	4.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.1	-	4.4	4.3
Reaction Ratings* ^{S05}		comment	2.0	-	1.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.0	-	-
Acid trail - Titratable Actual Acidity	2	mol H ⁺ /t	-	77	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.12	-	-
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	-	0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	0.07	-	-
Net Acid soluble sulfur	0.02	% S	-	0.05	-	-
Net Acid soluble sulfur - acidity units	10	mol H ⁺ /t	-	21	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	0.03	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	0.16	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H ⁺ /t	-	99	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	7.4	-	-
<2mm Fraction	0.005	g	-	75	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	1	%	-	20	-	-

Client Sample ID			BH084_1.5-1.75M	BH084_1.75-2.0M	BH085_0.0-0.25M	BH085_0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42875	B19-Se42876	B19-Se42877	B19-Se42878
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.9	4.8	5.6	5.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.7	4.2	2.8	3.7
Reaction Ratings* ^{S05}		comment	1.0	1.0	3.0	4.0

Client Sample ID			BH085_0.5-0.75M	BH085_0.75-1.00M	BH085_1.00-1.25M	BH085_1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se42879	B19-Se42880	B19-Se42881	B19-Se42882
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	-	5.2	5.3	-
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	-	4.2	4.5	-
Reaction Ratings* ^{S05}		comment	-	1.0	1.0	-
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.4	-	-	4.6
Acid trail - Titratable Actual Acidity	2	mol H+/t	50	-	-	23
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.080	-	-	0.040
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	-	< 3
Sulfur - KCl Extractable	0.02	% S	0.04	-	-	0.03
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	2.0
HCl Extractable Sulfur	0.02	% S	0.11	-	-	n/a
Net Acid soluble sulfur	0.02	% S	0.07	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	35	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	0.06	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	n/a	-	-	n/a
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	n/a	-	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	-	n/a
ANC Fineness Factor		factor	1.5	-	-	1.5
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	0.14	-	-	0.04
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	85	-	-	23
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	6.4	-	-	1.7
<2mm Fraction	0.005	g	42	-	-	36
>2mm Fraction	0.005	g	< 0.005	-	-	< 0.005
Analysed Material	0.1	%	100	-	-	100
Extraneous Material	0.1	%	< 0.1	-	-	< 0.1
% Moisture						
	1	%	17	-	-	23

Client Sample ID			BH085_1.5-1.75M	BH085_1.75-2.0M
Sample Matrix			Soil	Soil
Eurofins Sample No.			B19-Se42883	B19-Se42884
Date Sampled			Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit		
Acid Sulfate Soils Field pH Test				
pH-F (Field pH test)*	0.1	pH Units	6.5	5.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.8	5.6
Reaction Ratings* ^{S05}		comment	1.0	1.0

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

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 - Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests	Brisbane	Sep 30, 2019	7 Days
Chromium Suite (SKCI) - Method: LTM-GEN-7070	Brisbane	Sep 30, 2019	6 Week
% Moisture - Method: LTM-GEN-7080 Moisture	Brisbane	Sep 29, 2019	14 Days

Company Name: Tectonic Geotechnical Pty Ltd	Order No.:	Received: Sep 27, 2019 9:00 AM
Address: 40A Glen Vista Place Chevalum Qld 4555	Report #: 679658	Due: Oct 4, 2019
Project Name: MIBA - NORTH HARBOUR	Phone: 07 5478 9642	Priority: 5 Day
Project ID: 19210	Fax:	Contact Name: Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	BH025_0.0-0.25M	Sep 24, 2019		Soil	B19-Se42799	X		
2	BH025_0.25-0.5M	Sep 24, 2019		Soil	B19-Se42800		X	X
3	BH025_0.5-0.75M	Sep 24, 2019		Soil	B19-Se42801	X		
4	BH025_0.75-1.0M	Sep 24, 2019		Soil	B19-Se42802	X		
5	BH025_1.0-1.25M	Sep 24, 2019		Soil	B19-Se42803	X		
6	BH025_1.25-	Sep 24, 2019		Soil	B19-Se42804		X	X

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Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	5 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
7	BH025_1.5-1.75M	Sep 24, 2019		Soil	B19-Se42805	X		
8	BH025_1.75-2.0M	Sep 24, 2019		Soil	B19-Se42806	X		
9	BH026_0.0-0.25M	Sep 24, 2019		Soil	B19-Se42807		X	X
10	BH026_0.25-0.5M	Sep 24, 2019		Soil	B19-Se42808	X		
11	BH026_0.5-0.75M	Sep 24, 2019		Soil	B19-Se42809	X		
12	BH026_0.75-1.00M	Sep 24, 2019		Soil	B19-Se42810	X		
13	BH026_1.00-	Sep 24, 2019		Soil	B19-Se42811	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.25M							
14	BH026_1.25-1.5M	Sep 24, 2019		Soil	B19-Se42812		X	X
15	BH026_1.5-1.75M	Sep 24, 2019		Soil	B19-Se42813	X		
16	BH026_1.75-2.0M	Sep 24, 2019		Soil	B19-Se42814	X		
17	BH041_0.0-0.25M	Sep 24, 2019		Soil	B19-Se42815		X	X
18	BH041_0.25-0.5M	Sep 24, 2019		Soil	B19-Se42816	X		
19	BH041_0.5-0.75M	Sep 24, 2019		Soil	B19-Se42817	X		
20	BH041_0.75-	Sep 24, 2019		Soil	B19-Se42818	X		

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.00M							
21	BH041_1.00-1.25M	Sep 24, 2019		Soil	B19-Se42819		X	X
22	BH041_1.25-1.5M	Sep 24, 2019		Soil	B19-Se42820	X		
23	BH041_1.5-1.75M	Sep 24, 2019		Soil	B19-Se42821	X		
24	BH041_1.75-2.0M	Sep 24, 2019		Soil	B19-Se42822	X		
25	BH041_2.0-2.25M	Sep 24, 2019		Soil	B19-Se42823	X		
26	BH041_2.25-2.5M	Sep 24, 2019		Soil	B19-Se42824		X	X
27	BH041_2.5-	Sep 24, 2019		Soil	B19-Se42825	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	2.75M							
28	BH041_2.75-3.00M	Sep 24, 2019		Soil	B19-Se42826	X		
29	BH041_3.0-3.25M	Sep 24, 2019		Soil	B19-Se42827	X		
30	BH041_3.25-3.5M	Sep 24, 2019		Soil	B19-Se42828		X	X
31	BH063_0.0-0.25M	Sep 24, 2019		Soil	B19-Se42829	X		
32	BH063_0.25-0.5M	Sep 24, 2019		Soil	B19-Se42830	X		
33	BH063_0.5-0.75M	Sep 24, 2019		Soil	B19-Se42831		X	X
34	BH063_0.75-	Sep 24, 2019		Soil	B19-Se42832	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.0M							
35	BH063_1.0-1.25M	Sep 24, 2019		Soil	B19-Se42833	X		
36	BH063_1.25-1.5M	Sep 24, 2019		Soil	B19-Se42834	X		
37	BH063_1.5-1.75M	Sep 24, 2019		Soil	B19-Se42835	X		
38	BH063_1.75-2.0M	Sep 24, 2019		Soil	B19-Se42836		X	X
39	BH064_0.0-0.25M	Sep 24, 2019		Soil	B19-Se42837		X	X
40	BH064_0.25-0.5M	Sep 24, 2019		Soil	B19-Se42838	X		
41	BH064_0.5-	Sep 24, 2019		Soil	B19-Se42839	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	0.75M							
42	BH064_0.75-1.00M	Sep 24, 2019		Soil	B19-Se42840		X	X
43	BH064_1.00-1.25M	Sep 24, 2019		Soil	B19-Se42841	X		
44	BH064_1.25-1.5M	Sep 24, 2019		Soil	B19-Se42842	X		
45	BH064_1.5-1.75M	Sep 24, 2019		Soil	B19-Se42843	X		
46	BH064_1.75-2.0M	Sep 24, 2019		Soil	B19-Se42844	X		
47	BH065_0.0-0.25M	Sep 24, 2019		Soil	B19-Se42845	X		
48	BH065_0.25-	Sep 24, 2019		Soil	B19-Se42846	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	0.5M							
49	BH065_0.5-0.75M	Sep 24, 2019		Soil	B19-Se42847	X		
50	BH065_0.75-1.00M	Sep 24, 2019		Soil	B19-Se42848		X	X
51	BH065_1.00-1.25M	Sep 24, 2019		Soil	B19-Se42849	X		
52	BH065_1.25-1.5M	Sep 24, 2019		Soil	B19-Se42850	X		
53	BH065_1.5-1.75M	Sep 24, 2019		Soil	B19-Se42851	X		
54	BH065_1.75-2.0M	Sep 24, 2019		Soil	B19-Se42852		X	X
55	BH066_0.0-	Sep 24, 2019		Soil	B19-Se42853	X		

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	0.25M							
56	BH066_0.25-0.5M	Sep 24, 2019		Soil	B19-Se42854	X		
57	BH066_0.5-0.75M	Sep 24, 2019		Soil	B19-Se42855		X	X
58	BH066_0.75-1.00M	Sep 24, 2019		Soil	B19-Se42856	X		
59	BH066_1.00-1.25M	Sep 24, 2019		Soil	B19-Se42857	X		
60	BH066_1.25-1.5M	Sep 24, 2019		Soil	B19-Se42858	X		
61	BH066_1.5-1.75M	Sep 24, 2019		Soil	B19-Se42859		X	X
62	BH066_1.75-	Sep 24, 2019		Soil	B19-Se42860	X		

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	2.0M							
63	BH083_0.0-0.25M	Sep 24, 2019		Soil	B19-Se42861	X		
64	BH083_0.25-0.5M	Sep 24, 2019		Soil	B19-Se42862		X	X
65	BH083_0.5-0.75M	Sep 24, 2019		Soil	B19-Se42863	X		
66	BH083_0.75-1.00M	Sep 24, 2019		Soil	B19-Se42864	X		
67	BH083_1.00-1.25M	Sep 24, 2019		Soil	B19-Se42865	X		
68	BH083_1.25-1.5M	Sep 24, 2019		Soil	B19-Se42866		X	X
69	BH083_1.5-	Sep 24, 2019		Soil	B19-Se42867	X		

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.75M							
70	BH083_1.75-2.0M	Sep 24, 2019		Soil	B19-Se42868	X		
71	BH084_0.0-0.25M	Sep 24, 2019		Soil	B19-Se42869		X	X
72	BH084_0.25-0.5M	Sep 24, 2019		Soil	B19-Se42870	X		
73	BH084_0.5-0.75M	Sep 24, 2019		Soil	B19-Se42871	X		
74	BH084_0.75-1.00M	Sep 24, 2019		Soil	B19-Se42872		X	X
75	BH084_1.00-1.25M	Sep 24, 2019		Soil	B19-Se42873	X		
76	BH084_1.25-	Sep 24, 2019		Soil	B19-Se42874	X		

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
77	BH084_1.5-1.75M	Sep 24, 2019		Soil	B19-Se42875	X		
78	BH084_1.75-2.0M	Sep 24, 2019		Soil	B19-Se42876	X		
79	BH085_0.0-0.25M	Sep 24, 2019		Soil	B19-Se42877	X		
80	BH085_0.25-0.5M	Sep 24, 2019		Soil	B19-Se42878	X		
81	BH085_0.5-0.75M	Sep 24, 2019		Soil	B19-Se42879		X	X
82	BH085_0.75-1.00M	Sep 24, 2019		Soil	B19-Se42880	X		
83	BH085_1.00-	Sep 24, 2019		Soil	B19-Se42881	X		

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.25M							
84	BH085_1.25-1.5M	Sep 24, 2019		Soil	B19-Se42882		X	X
85	BH085_1.5-1.75M	Sep 24, 2019		Soil	B19-Se42883	X		
86	BH085_1.75-2.0M	Sep 24, 2019		Soil	B19-Se42884	X		
Test Counts						64	22	22

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

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

Units

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test				Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery									
Chromium Suite (SKCI)									
Chromium Reducible Sulfur				%	99		70-130	Pass	
Acid Neutralising Capacity (ANCbt)				%	96		70-130	Pass	
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)*	B19-Se42799	CP	pH Units	5.7	5.7	pass	30%	Pass	
Reaction Ratings*	B19-Se42799	CP	comment	4.0	4.0	pass	30%	Pass	
Duplicate									
Chromium Suite (SKCI)					Result 1	Result 2	RPD		
pH-KCL	B19-Se42800	CP	pH Units	4.1	4.1	<1	30%	Pass	
Acid trail - Titratable Actual Acidity	B19-Se42800	CP	mol H+/t	64	64	<1	30%	Pass	
sulfidic - TAA equiv. S% pyrite	B19-Se42800	CP	% pyrite S	0.10	0.10	<1	30%	Pass	
Chromium Reducible Sulfur	B19-Se42800	CP	% S	< 0.005	< 0.005	<1	30%	Pass	
Chromium Reducible Sulfur -acidity units	B19-Se42800	CP	mol H+/t	< 3	< 3	<1	30%	Pass	
Sulfur - KCl Extractable	B19-Se42800	CP	% S	0.02	0.02	7.0	30%	Pass	
Net Acid soluble sulfur	B19-Se42800	CP	% S	< 0.02	0.02	200	30%	Fail	Q15
Net Acid soluble sulfur - acidity units	B19-Se42800	CP	mol H+/t	< 10	11	200	30%	Fail	Q15
Net Acid soluble sulfur - equivalent S% pyrite	B19-Se42800	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
Acid Neutralising Capacity (ANCbt)	B19-Se42800	CP	% CaCO3	n/a	n/a	n/a	30%	Pass	
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	B19-Se42800	CP	% S	n/a	n/a	n/a	30%	Pass	
ANC Fineness Factor	B19-Se42800	CP	factor	1.5	1.5	<1	30%	Pass	
CRS Suite - Net Acidity (Sulfur Units)	B19-Se42800	CP	% S	0.10	0.10	n/a	30%	Pass	
CRS Suite - Net Acidity (Acidity Units)	B19-Se42800	CP	mol H+/t	73	75	n/a	30%	Pass	
CRS Suite - Liming Rate	B19-Se42800	CP	kg CaCO3/t	5.5	5.6	3.0	30%	Pass	
Duplicate									
					Result 1	Result 2	RPD		
% Moisture	B19-Se42800	CP	%	20	16	19	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test					Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se42813	CP	pH Units	5.3	5.2	pass	30%	Pass	
Reaction Ratings*	B19-Se42813	CP	comment	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test					Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se42826	CP	pH Units	8.5	8.7	pass	30%	Pass	
Reaction Ratings*	B19-Se42826	CP	comment	1.0	1.0	pass	30%	Pass	
Duplicate									
Chromium Suite (SKCI)					Result 1	Result 2	RPD		
pH-KCL	B19-Se42837	CP	pH Units	5.2	5.2	<1	30%	Pass	
Acid trail - Titratable Actual Acidity	B19-Se42837	CP	mol H+/t	11	11	<1	30%	Pass	
sulfidic - TAA equiv. S% pyrite	B19-Se42837	CP	% pyrite S	0.020	0.020	<1	30%	Pass	
Chromium Reducible Sulfur	B19-Se42837	CP	% S	< 0.005	< 0.005	<1	30%	Pass	
Chromium Reducible Sulfur -acidity units	B19-Se42837	CP	mol H+/t	< 3	< 3	<1	30%	Pass	
Sulfur - KCl Extractable	B19-Se42837	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
Net Acid soluble sulfur	B19-Se42837	CP	% S	n/a	n/a	n/a	30%	Pass	

Duplicate								
Chromium Suite (SKCI)				Result 1	Result 2	RPD		
Net Acid soluble sulfur - acidity units	B19-Se42837	CP	mol H+/t	n/a	n/a	n/a	30%	Pass
Net Acid soluble sulfur - equivalent S% pyrite	B19-Se42837	CP	% S	n/a	n/a	n/a	30%	Pass
Acid Neutralising Capacity (ANCbt)	B19-Se42837	CP	% CaCO3	n/a	n/a	n/a	30%	Pass
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	B19-Se42837	CP	% S	n/a	n/a	n/a	30%	Pass
ANC Fineness Factor	B19-Se42837	CP	factor	1.5	1.5	<1	30%	Pass
CRS Suite - Net Acidity (Sulfur Units)	B19-Se42837	CP	% S	0.02	0.02	n/a	30%	Pass
CRS Suite - Net Acidity (Acidity Units)	B19-Se42837	CP	mol H+/t	11	11	n/a	30%	Pass
CRS Suite - Liming Rate	B19-Se42837	CP	kg CaCO3/t	< 1	< 1	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	B19-Se42837	CP	%	5.9	5.7	3.0	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se42841	CP	pH Units	5.8	5.8	pass	30%	Pass
Reaction Ratings*	B19-Se42841	CP	comment	2.0	2.0	pass	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se42853	CP	pH Units	5.4	5.3	pass	30%	Pass
Reaction Ratings*	B19-Se42853	CP	comment	3.0	3.0	pass	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se42867	CP	pH Units	5.1	5.0	pass	30%	Pass
Reaction Ratings*	B19-Se42867	CP	comment	1.0	1.0	pass	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	B19-Se42879	CP	%	17	16	6.0	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se42880	CP	pH Units	5.2	5.2	pass	30%	Pass
Reaction Ratings*	B19-Se42880	CP	comment	1.0	1.0	pass	30%	Pass

Comments
Sample Integrity

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

Qualifier Codes/Comments

Code	Description
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.
S01	Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO3) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from 'kg/t dry weight' to 'kg/m3 in-situ soil' multiply 'reported results' x 'wet bulk density of soil in t/m3'
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5
S03	Acid Neutralising Capacity is only required if the pHKCl is 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
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised By

Ryan Gilbert	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](#).

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 Accreditation Number 1261
 Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: **Mark Thomson**

Report **679878-S**
 Project name **MIBA - NORTH HARBOUR**
 Project ID **19210**
 Received Date **Sep 30, 2019**

Client Sample ID			BH045 - 0.0-0.25M	BH045 - 0.25-0.5M	BH045 - 0.5-0.75M	BH045 - 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44439	B19-Se44440	B19-Se44441	B19-Se44442
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.5	5.9	6.4	6.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.4	3.4	3.8	4.6
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.9	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	20	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.030	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	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	-	0.03	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	20	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	1.5	-	-
<2mm Fraction	0.005	g	-	66	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	5.5	-	-

Client Sample ID			BH045 - 1.0-1.25M	BH045 - 1.25-1.5M	BH045 - 1.5-1.75M	BH045 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44443	B19-Se44444	B19-Se44445	B19-Se44446
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.6	7.1	7.5	7.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.2	6.7	8.2	8.3
Reaction Ratings**S05		comment	3.0	2.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	5.8	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	8.1	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.010	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	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	-	< 0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	< 1	-	-
<2mm Fraction	0.005	g	-	43	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	13	-	-

Client Sample ID			BH045 - 2.0-2.25M	BH045 - 2.25-2.5M	BH045 - 2.5-2.75M	BH045 - 2.75-3.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44447	B19-Se44448	B19-Se44449	B19-Se44450
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.5	8.1	8.3	8.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.0	7.3	7.3	8.2
Reaction Ratings**S05		comment	4.0	2.0	2.0	4.0

Client Sample ID			BH045 - 3.0-3.25M	BH045 - 3.25-3.5M	BH050 - 0.0-0.25M	BH050 - 0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44451	B19-Se44452	B19-Se44453	B19-Se44454
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.5	8.6	5.8	6.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.3	7.2	3.2	4.2
Reaction Ratings* ^{S05}		comment	2.0	2.0	3.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	6.7	-	4.9	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	< 2	-	28	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	< 0.003	-	0.050	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	< 0.005	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	< 3	-
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	2.0	-
HCl Extractable Sulfur	0.02	% S	n/a	-	n/a	-
Net Acid soluble sulfur	0.02	% S	n/a	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	0.37	-	n/a	-
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	73	-	n/a	-
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	0.12	-	n/a	-
ANC Fineness Factor		factor	1.5	-	1.5	-
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	< 0.02	-	0.05	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	< 10	-	28	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	< 1	-	2.1	-
<2mm Fraction	0.005	g	91	-	40	-
>2mm Fraction	0.005	g	< 0.005	-	< 0.005	-
Analysed Material	0.1	%	100	-	100	-
Extraneous Material	0.1	%	< 0.1	-	< 0.1	-
% Moisture						
	1	%	19	-	11	-

Client Sample ID			BH050 - 0.5-0.75M	BH050 - 0.75-1.0M	BH050 - 1.0-1.25M	BH050 - 1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44455	B19-Se44456	B19-Se44457	B19-Se44458
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.5	6.8	7.2	7.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.5	4.8	5.5	6.8
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	5.6	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	8.5	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.010	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-

Client Sample ID			BH050 - 0.5-0.75M	BH050 - 0.75-1.0M	BH050 - 1.0-1.25M	BH050 - 1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44455	B19-Se44456	B19-Se44457	B19-Se44458
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	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	-	-	< 0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	< 10	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	< 1	-
<2mm Fraction	0.005	g	-	-	79	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture	1	%	-	-	20	-

Client Sample ID			BH050 - 1.5-1.75M	BH050 - 1.75-2.0M	BH050 - 2.00-2.25M	BH050 - 2.25-2.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44459	B19-Se44460	B19-Se44461	B19-Se44462
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.8	8.0	8.2	8.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.2	7.6	7.2	7.0
Reaction Ratings ^{S05}		comment	2.0	4.0	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	6.2	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	3.1	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	< 0.003	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	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	-	-	< 0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	< 10	-

Client Sample ID			BH050 - 1.5-1.75M	BH050 - 1.75-2.0M	BH050 - 2.00-2.25M	BH050 - 2.25-2.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44459	B19-Se44460	B19-Se44461	B19-Se44462
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	< 1	-
<2mm Fraction	0.005	g	-	-	56	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture						
	1	%	-	-	20	-

Client Sample ID			BH050 - 2.5-2.75M	BH050 - 2.75-3.0M	BH050 - 3.0-3.25M	BH050 - 3.25-3.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44463	B19-Se44464	B19-Se44465	B19-Se44466
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.3	8.2	8.3	8.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.1	7.0	7.1	7.0
Reaction Ratings* ^{S05}		comment	4.0	2.0	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	6.5	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	< 2	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	< 0.003	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	-	< 0.005	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	-	< 3	-
Sulfur - KCl Extractable	0.02	% S	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	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	-	-	< 0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	< 10	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	< 1	-
<2mm Fraction	0.005	g	-	-	120	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture						
	1	%	-	-	18	-

Client Sample ID			BH051 - 0.0-0.25M	BH051 - 0.25-0.5M	BH051 - 0.5-0.75M	BH051 - 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44467	B19-Se44468	B19-Se44469	B19-Se44470
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.7	5.9	5.7	5.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.3	4.6	4.5	4.5
Reaction Ratings**S05		comment	3.0	3.0	3.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	4.6	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	37	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	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	-	-	37	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	2.8	-
<2mm Fraction	0.005	g	-	-	63	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture	1	%	-	-	20	-

Client Sample ID			BH051 - 1.0-1.25M	BH051 - 1.25-1.5M	BH051 - 1.5-1.75M	BH051 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44471	B19-Se44472	B19-Se44473	B19-Se44474
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.7	6.5	7.5	7.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.3	4.8	6.2	5.8
Reaction Ratings**S05		comment	2.0	2.0	1.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	5.8	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	7.3	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.010	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-

Client Sample ID			BH051 - 1.0-1.25M	BH051 - 1.25-1.5M	BH051 - 1.5-1.75M	BH051 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44471	B19-Se44472	B19-Se44473	B19-Se44474
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	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	-	-	< 0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	< 10	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	< 1	-
<2mm Fraction	0.005	g	-	-	96	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture	1	%	-	-	27	-

Client Sample ID			BH051 - 2.0-2.25M	BH051 - 2.25-2.5M	BH051 - 2.5-2.75M	BH051 - 2.75-3.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44475	B19-Se44476	B19-Se44477	B19-Se44478
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.3	7.6	7.8	8.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	6.3	6.4	6.5	6.5
Reaction Ratings ^{S05}		comment	2.0	2.0	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	6.0	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	4.5	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.010	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	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	-	-	< 0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	< 10	-

Client Sample ID			BH051 - 2.0-2.25M	BH051 - 2.25-2.5M	BH051 - 2.5-2.75M	BH051 - 2.75-3.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44475	B19-Se44476	B19-Se44477	B19-Se44478
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	< 1	-
<2mm Fraction	0.005	g	-	-	98	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture						
	1	%	-	-	23	-

Client Sample ID			BH051 - 3.0-3.25M	BH051 - 3.25-3.5M	BH052 - 0.0-0.25M	BH052 - 0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44479	B19-Se44480	B19-Se44481	B19-Se44482
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.6	7.5	6.1	5.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	6.4	5.7	4.0	3.9
Reaction Ratings* ^{S05}		comment	2.0	2.0	4.0	3.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	4.9	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	22	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.040	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	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	-	-	0.04	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	22	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	1.7	-
<2mm Fraction	0.005	g	-	-	61	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture						
	1	%	-	-	10	-

Client Sample ID			BH052 - 0.5-0.75M	BH052 - 0.75-1.0M	BH052 - 1.0-1.25M	BH052 - 1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44483	B19-Se44484	B19-Se44485	B19-Se44486
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.7	6.9	7.8	7.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.9	5.1	6.4	6.8
Reaction Ratings**S05		comment	2.0	2.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	5.9
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	5.6
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.010
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	-	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	-	-	-	< 0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	< 10
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	< 1
<2mm Fraction	0.005	g	-	-	-	120
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture	1	%	-	-	-	20

Client Sample ID			BH052 - 1.5-1.75M	BH052 - 1.75-2.0M	BH052 - 2.0-2.25M	BH052 - 2.25-2.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44487	B19-Se44488	B19-Se44489	B19-Se44490
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.9	8.1	8.1	7.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.6	7.4	7.2	6.5
Reaction Ratings**S05		comment	4.0	4.0	2.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	5.9
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	4.9
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.010
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0

Client Sample ID			BH052 - 1.5-1.75M	BH052 - 1.75-2.0M	BH052 - 2.0-2.25M	BH052 - 2.25-2.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44487	B19-Se44488	B19-Se44489	B19-Se44490
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	-	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	-	-	-	< 0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	< 10
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	-	< 1
<2mm Fraction	0.005	g	-	-	-	77
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture	1	%	-	-	-	22

Client Sample ID			BH052 - 2.5-2.75M	BH052 - 2.75-3.0M	BH052 - 3.0-3.25M	BH052 - 3.25-3.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44491	B19-Se44492	B19-Se44493	B19-Se44494
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.1	8.0	8.2	8.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	6.7	6.9	6.9	6.8
Reaction Ratings ^{S05}		comment	1.0	4.0	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	6.1
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	4.1
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.010
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	-	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	-	-	-	< 0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	< 10

Client Sample ID			BH052 - 2.5-2.75M	BH052 - 2.75-3.0M	BH052 - 3.0-3.25M	BH052 - 3.25-3.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44491	B19-Se44492	B19-Se44493	B19-Se44494
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	< 1
<2mm Fraction	0.005	g	-	-	-	60
>2mm Fraction	0.005	g	-	-	-	2.0
Analysed Material	0.1	%	-	-	-	97
Extraneous Material	0.1	%	-	-	-	3.2
% Moisture						
	1	%	-	-	-	18

Client Sample ID			BH054 - 0.0-0.25M	BH054 - 0.25-0.5M	BH054 - 0.5-0.75M	BH054 - 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44495	B19-Se44496	B19-Se44497	B19-Se44498
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.2	6.5	6.6	6.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.2	4.0	4.9	5.2
Reaction Ratings* ^{S05}		comment	3.0	4.0	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.9	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	30	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.050	-	-	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	0.005	-	-	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	3.4	-	-	-
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-
HCl Extractable Sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	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	0.05	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	34	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	2.5	-	-	-
<2mm Fraction	0.005	g	41	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture						
	1	%	13	-	-	-

Client Sample ID			BH054 - 1.0-1.25M	BH054 - 1.25-1.5M	BH054 - 1.5-1.75M	BH054 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44499	B19-Se44500	B19-Se44501	B19-Se44502
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.5	7.6	7.6	8.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	6.0	7.6	7.1	6.6
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	5.6	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	6.5	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.010	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	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	-	< 0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	< 1	-	-
<2mm Fraction	0.005	g	-	72	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	19	-	-

Client Sample ID			BH054 - 2.0-2.25M	BH054 - 2.25-2.5M	BH054 - 2.5-2.75M	BH054 - 2.75-3.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44503	B19-Se44504	B19-Se44505	B19-Se44506
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.9	8.2	8.3	8.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	6.7	6.6	6.8	6.5
Reaction Ratings* ^{S05}		comment	2.0	2.0	4.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	6.3
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	3.6
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.010
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0

Client Sample ID			BH054 - 2.0-2.25M	BH054 - 2.25-2.5M	BH054 - 2.5-2.75M	BH054 - 2.75-3.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44503	B19-Se44504	B19-Se44505	B19-Se44506
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	-	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	-	-	-	< 0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	< 10
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	-	< 1
<2mm Fraction	0.005	g	-	-	-	120
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture	1	%	-	-	-	20

Client Sample ID			BH054 - 3.0-3.25M	BH054 - 3.25-3.5M	BH062 - 0.0-0.25M	BH062 - 0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44507	B19-Se44508	B19-Se44509	B19-Se44510
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.2	8.4	6.1	6.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	6.7	6.7	3.1	4.2
Reaction Ratings ^{S05}		comment	1.0	2.0	2.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	5.4
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	10
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.020
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	-	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	-	-	-	0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	10

Client Sample ID			BH054 - 3.0-3.25M	BH054 - 3.25-3.5M	BH062 - 0.0-0.25M	BH062 - 0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44507	B19-Se44508	B19-Se44509	B19-Se44510
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	< 1
<2mm Fraction	0.005	g	-	-	-	60
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture						
	1	%	-	-	-	11

Client Sample ID			BH062 - 0.5-0.75M	BH062 - 0.75-1.0M	BH062 - 1.0-1.25M	BH062 - 1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44511	B19-Se44512	B19-Se44513	B19-Se44514
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.7	5.9	6.1	6.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.3	4.5	4.2	4.4
Reaction Ratings* ^{S05}		comment	2.0	1.0	1.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	5.9	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	3.5	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.010	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	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	-	-	< 0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	< 10	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	< 1	-
<2mm Fraction	0.005	g	-	-	63	-
>2mm Fraction	0.005	g	-	-	0.28	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	0.4	-
% Moisture						
	1	%	-	-	12	-

Client Sample ID			BH062 - 1.5-1.75M	BH062 - 1.75-2.0M	BH070 - 0.0-0.25M	BH070 - 0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44515	B19-Se44516	B19-Se44517	B19-Se44518
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.2	6.4	6.2	6.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.3	3.9	3.2	3.8
Reaction Ratings**S05		comment	1.0	2.0	3.0	3.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	5.5	-	4.8
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	5.4	-	27
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.010	-	0.040
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	< 0.005	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	< 3	-	< 3
Sulfur - KCl Extractable	0.02	% S	-	< 0.02	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	2.0
HCl Extractable Sulfur	0.02	% S	-	n/a	-	n/a
Net Acid soluble sulfur	0.02	% S	-	n/a	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	n/a	-	n/a
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	-	n/a	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	-	n/a	-	n/a
ANC Fineness Factor		factor	-	1.5	-	1.5
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	-	< 0.02	-	0.04
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	-	27
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	< 1	-	2.0
<2mm Fraction	0.005	g	-	95	-	87
>2mm Fraction	0.005	g	-	0.16	-	0.89
Analysed Material	0.1	%	-	100	-	99
Extraneous Material	0.1	%	-	0.2	-	1.0
% Moisture	1	%	-	11	-	17

Client Sample ID			BH070 - 0.5-0.75M	BH070 - 0.75-1.0M	BH070 - 1.0-1.25M	BH070 - 1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44519	B19-Se44520	B19-Se44521	B19-Se44522
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.5	6.2	6.0	5.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.8	5.0	4.4	4.7
Reaction Ratings**S05		comment	1.0	1.0	1.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	5.1
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	11
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.020
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0

Client Sample ID			BH070 - 0.5-0.75M	BH070 - 0.75-1.0M	BH070 - 1.0-1.25M	BH070 - 1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44519	B19-Se44520	B19-Se44521	B19-Se44522
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	-	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	-	-	-	0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	11
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	-	< 1
<2mm Fraction	0.005	g	-	-	-	83
>2mm Fraction	0.005	g	-	-	-	0.59
Analysed Material	0.1	%	-	-	-	99
Extraneous Material	0.1	%	-	-	-	0.7
% Moisture	1	%	-	-	-	9.5

Client Sample ID			BH070 - 1.5-1.75M	BH070 - 1.75-2.0M	BH071 - 0.0-0.25M	BH071 - 0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44523	B19-Se44524	B19-Se44525	B19-Se44526
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.7	5.5	5.8	5.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.3	4.8	2.7	3.9
Reaction Ratings ^{S05}		comment	1.0	1.0	2.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	4.6
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	45
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.070
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	-	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	-	-	-	0.07
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	45

Client Sample ID			BH070 - 1.5-1.75M	BH070 - 1.75-2.0M	BH071 - 0.0-0.25M	BH071 - 0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44523	B19-Se44524	B19-Se44525	B19-Se44526
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	3.4
<2mm Fraction	0.005	g	-	-	-	99
>2mm Fraction	0.005	g	-	-	-	3.7
Analysed Material	0.1	%	-	-	-	96
Extraneous Material	0.1	%	-	-	-	3.6
% Moisture	1	%	-	-	-	16

Client Sample ID			BH071 - 0.5-0.75M	BH071 - 0.75-1.00M	BH071 - 1.000-1.25M	BH071 - 1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44527	B19-Se44528	B19-Se44529	B19-Se44530
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.7	5.7	5.6	5.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.3	4.8	4.6	4.8
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	4.8	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	81	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.13	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	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	-	-	0.13	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	81	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	6.1	-
<2mm Fraction	0.005	g	-	-	45	-
>2mm Fraction	0.005	g	-	-	3.3	-
Analysed Material	0.1	%	-	-	93	-
Extraneous Material	0.1	%	-	-	6.8	-
% Moisture	1	%	-	-	22	-

Client Sample ID			BH071 - 1.5-1.75M	BH071 - 1.75-2.0M	BH072 - 0.0-0.25M	BH072 - 0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44531	B19-Se44532	B19-Se44533	B19-Se44534
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.8	5.8	6.0	5.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.7	4.6	3.7	4.0
Reaction Ratings**S05		comment	1.0	1.0	1.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	5.8	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	3.6	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.010	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	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	-	-	< 0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	< 10	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	< 1	-
<2mm Fraction	0.005	g	-	-	98	-
>2mm Fraction	0.005	g	-	-	0.43	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	0.4	-
% Moisture	1	%	-	-	< 1	-

Client Sample ID			BH072 - 0.5-0.75M	BH072 - 0.75-1.0M	BH072 - 1.0-1.25M	BH072 - 1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44535	B19-Se44536	B19-Se44537	B19-Se44538
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.9	6.3	6.1	5.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.3	5.2	4.9	4.8
Reaction Ratings**S05		comment	1.0	1.0	1.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	5.7	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	3.9	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.010	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-

Client Sample ID			BH072 - 0.5-0.75M	BH072 - 0.75-1.0M	BH072 - 1.0-1.25M	BH072 - 1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44535	B19-Se44536	B19-Se44537	B19-Se44538
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	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	-	-	< 0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	< 10	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	< 1	-
<2mm Fraction	0.005	g	-	-	42	-
>2mm Fraction	0.005	g	-	-	1.1	-
Analysed Material	0.1	%	-	-	97	-
Extraneous Material	0.1	%	-	-	2.6	-
% Moisture	1	%	-	-	7.3	-

Client Sample ID			BH072 - 1.5-1.75M	BH072 - 1.75-2.0M	BH073 - 0.0-0.25M	BH073 - 0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44539	B19-Se44540	B19-Se44541	B19-Se44542
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.3	6.5	5.8	5.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.9	3.4	3.9	3.9
Reaction Ratings ^{S05}		comment	1.0	2.0	2.0	1.0

Client Sample ID			BH073 - 0.5-0.75M	BH073 - 0.75-1.0M	BH073 - 1.0-1.25M	BH073 - 1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44543	B19-Se44544	B19-Se44545	B19-Se44546
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.8	5.9	6.0	5.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.4	4.6	4.7	4.6
Reaction Ratings ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	6.0	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	2.8	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	< 0.003	-	-	-
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	< 0.02	-	-	-

Client Sample ID			BH073 - 0.5-0.75M	BH073 - 0.75-1.0M	BH073 - 1.0-1.25M	BH073 - 1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44543	B19-Se44544	B19-Se44545	B19-Se44546
Date Sampled			Sep 24, 2019	Sep 24, 2019	Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-
HCl Extractable Sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	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	< 0.02	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	< 10	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	< 1	-	-	-
<2mm Fraction	0.005	g	55	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture	1	%	< 1	-	-	-

Client Sample ID			BH073 - 1.5-1.75M	BH073 - 1.75-2.0M
Sample Matrix			Soil	Soil
Eurofins Sample No.			B19-Se44547	B19-Se44548
Date Sampled			Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit		
Acid Sulfate Soils Field pH Test				
pH-F (Field pH test)*	0.1	pH Units	6.0	5.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.4	4.9
Reaction Ratings ^{S05}		comment	1.0	2.0
Chromium Suite (SKCI)				
pH-KCL	0.1	pH Units	-	4.6
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	52
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.080
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	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0
HCl Extractable Sulfur	0.02	% S	-	n/a
Net Acid soluble sulfur	0.02	% S	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	0.08

Client Sample ID			BH073 - 1.5-1.75M	BH073 - 1.75-2.0M
Sample Matrix			Soil	Soil
Eurofins Sample No.			B19-Se44547	B19-Se44548
Date Sampled			Sep 24, 2019	Sep 24, 2019
Test/Reference	LOR	Unit		
Chromium Suite (SKCI)				
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	52
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	3.9
<2mm Fraction	0.005	g	-	66
>2mm Fraction	0.005	g	-	< 0.005
Analysed Material	0.1	%	-	100
Extraneous Material	0.1	%	-	< 0.1
% Moisture				
	1	%	-	5.3

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

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 - Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests	Brisbane	Oct 02, 2019	7 Days
Chromium Suite (SKCI) - Method: LTM-GEN-7070	Brisbane	Oct 02, 2019	6 Week
% Moisture - Method: LTM-GEN-7080 Moisture	Brisbane	Sep 30, 2019	14 Days

Company Name: Tectonic Geotechnical Pty Ltd	Order No.:	Received: Sep 30, 2019 9:00 AM
Address: 40A Glen Vista Place Chevalum Qld 4555	Report #: 679878	Due: Oct 9, 2019
	Phone: 07 5478 9642	Priority: 7 Day
	Fax:	Contact Name: Mark Thomson
Project Name: MIBA - NORTH HARBOUR		
Project ID: 19210		

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	BH045 - 0.0-0.25M	Sep 24, 2019		Soil	B19-Se44439	X		
2	BH045 - 0.25-0.5M	Sep 24, 2019		Soil	B19-Se44440	X	X	X
3	BH045 - 0.5-0.75M	Sep 24, 2019		Soil	B19-Se44441	X		
4	BH045 - 0.75-1.0M	Sep 24, 2019		Soil	B19-Se44442	X		
5	BH045 - 1.0-1.25M	Sep 24, 2019		Soil	B19-Se44443	X		
6	BH045 - 1.25-	Sep 24, 2019		Soil	B19-Se44444	X	X	X

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Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	7 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
7	BH045 - 1.5-1.75M	Sep 24, 2019		Soil	B19-Se44445	X		
8	BH045 - 1.75-2.0M	Sep 24, 2019		Soil	B19-Se44446	X		
9	BH045 - 2.0-2.25M	Sep 24, 2019		Soil	B19-Se44447	X		
10	BH045 - 2.25-2.5M	Sep 24, 2019		Soil	B19-Se44448	X		
11	BH045 - 2.5-2.75M	Sep 24, 2019		Soil	B19-Se44449	X		
12	BH045 - 2.75-3.0M	Sep 24, 2019		Soil	B19-Se44450	X		
13	BH045 - 3.0-	Sep 24, 2019		Soil	B19-Se44451	X	X	X

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Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	7 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	3.25M							
14	BH045 - 3.25-3.5M	Sep 24, 2019		Soil	B19-Se44452	X		
15	BH050 - 0.0-0.25M	Sep 24, 2019		Soil	B19-Se44453	X	X	X
16	BH050 - 0.25-0.5M	Sep 24, 2019		Soil	B19-Se44454	X		
17	BH050 - 0.5-0.75M	Sep 24, 2019		Soil	B19-Se44455	X		
18	BH050 - 0.75-1.0M	Sep 24, 2019		Soil	B19-Se44456	X		
19	BH050 - 1.0-1.25M	Sep 24, 2019		Soil	B19-Se44457	X	X	X
20	BH050 - 1.25-	Sep 24, 2019		Soil	B19-Se44458	X		

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Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	7 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
21	BH050 - 1.5-1.75M	Sep 24, 2019		Soil	B19-Se44459	X		
22	BH050 - 1.75-2.0M	Sep 24, 2019		Soil	B19-Se44460	X		
23	BH050 - 2.00-2.25M	Sep 24, 2019		Soil	B19-Se44461	X	X	X
24	BH050 - 2.25-2.5M	Sep 24, 2019		Soil	B19-Se44462	X		
25	BH050 - 2.5-2.75M	Sep 24, 2019		Soil	B19-Se44463	X		
26	BH050 - 2.75-3.0M	Sep 24, 2019		Soil	B19-Se44464	X		
27	BH050 - 3.0-	Sep 24, 2019		Soil	B19-Se44465	X	X	X

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Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	7 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	3.25M							
28	BH050 - 3.25-3.5M	Sep 24, 2019		Soil	B19-Se44466	X		
29	BH051 - 0.0-0.25M	Sep 24, 2019		Soil	B19-Se44467	X		
30	BH051 - 0.25-0.5M	Sep 24, 2019		Soil	B19-Se44468	X		
31	BH051 - 0.5-0.75M	Sep 24, 2019		Soil	B19-Se44469	X	X	X
32	BH051 - 0.75-1.0M	Sep 24, 2019		Soil	B19-Se44470	X		
33	BH051 - 1.0-1.25M	Sep 24, 2019		Soil	B19-Se44471	X		
34	BH051 - 1.25-	Sep 24, 2019		Soil	B19-Se44472	X		

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Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	7 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
35	BH051 - 1.5-1.75M	Sep 24, 2019		Soil	B19-Se44473	X	X	X
36	BH051 - 1.75-2.0M	Sep 24, 2019		Soil	B19-Se44474	X		
37	BH051 - 2.0-2.25M	Sep 24, 2019		Soil	B19-Se44475	X		
38	BH051 - 2.25-2.5M	Sep 24, 2019		Soil	B19-Se44476	X		
39	BH051 - 2.5-2.75M	Sep 24, 2019		Soil	B19-Se44477	X	X	X
40	BH051 - 2.75-3.0M	Sep 24, 2019		Soil	B19-Se44478	X		
41	BH051 - 3.0-	Sep 24, 2019		Soil	B19-Se44479	X		

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Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	7 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson
Eurofins Analytical Services Manager : Ryan Gilbert					

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	3.25M							
42	BH051 - 3.25-3.5M	Sep 24, 2019		Soil	B19-Se44480	X		
43	BH052 - 0.0-0.25M	Sep 24, 2019		Soil	B19-Se44481	X	X	X
44	BH052 - 0.25-0.5M	Sep 24, 2019		Soil	B19-Se44482	X		
45	BH052 - 0.5-0.75M	Sep 24, 2019		Soil	B19-Se44483	X		
46	BH052 - 0.75-1.0M	Sep 24, 2019		Soil	B19-Se44484	X		
47	BH052 - 1.0-1.25M	Sep 24, 2019		Soil	B19-Se44485	X		
48	BH052 - 1.25-	Sep 24, 2019		Soil	B19-Se44486	X	X	X

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Eurofins Analytical Services Manager : Ryan Gilbert					

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
49	BH052 - 1.5-1.75M	Sep 24, 2019		Soil	B19-Se44487	X		
50	BH052 - 1.75-2.0M	Sep 24, 2019		Soil	B19-Se44488	X		
51	BH052 - 2.0-2.25M	Sep 24, 2019		Soil	B19-Se44489	X		
52	BH052 - 2.25-2.5M	Sep 24, 2019		Soil	B19-Se44490	X	X	X
53	BH052 - 2.5-2.75M	Sep 24, 2019		Soil	B19-Se44491	X		
54	BH052 - 2.75-3.0M	Sep 24, 2019		Soil	B19-Se44492	X		
55	BH052 - 3.0-	Sep 24, 2019		Soil	B19-Se44493	X		

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	3.25M							
56	BH052 - 3.25-3.5M	Sep 24, 2019		Soil	B19-Se44494	X	X	X
57	BH054 - 0.0-0.25M	Sep 24, 2019		Soil	B19-Se44495	X	X	X
58	BH054 - 0.25-0.5M	Sep 24, 2019		Soil	B19-Se44496	X		
59	BH054 - 0.5-0.75M	Sep 24, 2019		Soil	B19-Se44497	X		
60	BH054 - 0.75-1.0M	Sep 24, 2019		Soil	B19-Se44498	X		
61	BH054 - 1.0-1.25M	Sep 24, 2019		Soil	B19-Se44499	X		
62	BH054 - 1.25-	Sep 24, 2019		Soil	B19-Se44500	X	X	X

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
63	BH054 - 1.5-1.75M	Sep 24, 2019		Soil	B19-Se44501	X		
64	BH054 - 1.75-2.0M	Sep 24, 2019		Soil	B19-Se44502	X		
65	BH054 - 2.0-2.25M	Sep 24, 2019		Soil	B19-Se44503	X		
66	BH054 - 2.25-2.5M	Sep 24, 2019		Soil	B19-Se44504	X		
67	BH054 - 2.5-2.75M	Sep 24, 2019		Soil	B19-Se44505	X		
68	BH054 - 2.75-3.0M	Sep 24, 2019		Soil	B19-Se44506	X	X	X
69	BH054 - 3.0-	Sep 24, 2019		Soil	B19-Se44507	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson
Eurofins Analytical Services Manager : Ryan Gilbert					

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	3.25M							
70	BH054 - 3.25-3.5M	Sep 24, 2019		Soil	B19-Se44508	X		
71	BH062 - 0.0-0.25M	Sep 24, 2019		Soil	B19-Se44509	X		
72	BH062 - 0.25-0.5M	Sep 24, 2019		Soil	B19-Se44510	X	X	X
73	BH062 - 0.5-0.75M	Sep 24, 2019		Soil	B19-Se44511	X		
74	BH062 - 0.75-1.0M	Sep 24, 2019		Soil	B19-Se44512	X		
75	BH062 - 1.0-1.25M	Sep 24, 2019		Soil	B19-Se44513	X	X	X
76	BH062 - 1.25-	Sep 24, 2019		Soil	B19-Se44514	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
77	BH062 - 1.5-1.75M	Sep 24, 2019		Soil	B19-Se44515	X		
78	BH062 - 1.75-2.0M	Sep 24, 2019		Soil	B19-Se44516	X	X	X
79	BH070 - 0.0-0.25M	Sep 24, 2019		Soil	B19-Se44517	X		
80	BH070 - 0.25-0.5M	Sep 24, 2019		Soil	B19-Se44518	X	X	X
81	BH070 - 0.5-0.75M	Sep 24, 2019		Soil	B19-Se44519	X		
82	BH070 - 0.75-1.0M	Sep 24, 2019		Soil	B19-Se44520	X		
83	BH070 - 1.0-	Sep 24, 2019		Soil	B19-Se44521	X		

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.25M							
84	BH070 - 1.25-1.5M	Sep 24, 2019		Soil	B19-Se44522	X	X	X
85	BH070 - 1.5-1.75M	Sep 24, 2019		Soil	B19-Se44523	X		
86	BH070 - 1.75-2.0M	Sep 24, 2019		Soil	B19-Se44524	X		
87	BH071 - 0.0-0.25M	Sep 24, 2019		Soil	B19-Se44525	X		
88	BH071 - 0.25-0.5M	Sep 24, 2019		Soil	B19-Se44526	X	X	X
89	BH071 - 0.5-0.75M	Sep 24, 2019		Soil	B19-Se44527	X		
90	BH071 - 0.75-	Sep 24, 2019		Soil	B19-Se44528	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson
Eurofins Analytical Services Manager : Ryan Gilbert					

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.00M							
91	BH071 - 1.000-1.25M	Sep 24, 2019		Soil	B19-Se44529	X	X	X
92	BH071 - 1.25-1.5M	Sep 24, 2019		Soil	B19-Se44530	X		
93	BH071 - 1.5-1.75M	Sep 24, 2019		Soil	B19-Se44531	X		
94	BH071 - 1.75-2.0M	Sep 24, 2019		Soil	B19-Se44532	X		
95	BH072 - 0.0-0.25M	Sep 24, 2019		Soil	B19-Se44533	X	X	X
96	BH072 - 0.25-0.5M	Sep 24, 2019		Soil	B19-Se44534	X		
97	BH072 - 0.5-	Sep 24, 2019		Soil	B19-Se44535	X		

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Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	0.75M							
98	BH072 - 0.75-1.0M	Sep 24, 2019		Soil	B19-Se44536	X		
99	BH072 - 1.0-1.25M	Sep 24, 2019		Soil	B19-Se44537	X	X	X
100	BH072 - 1.25-1.5M	Sep 24, 2019		Soil	B19-Se44538	X		
101	BH072 - 1.5-1.75M	Sep 24, 2019		Soil	B19-Se44539	X		
102	BH072 - 1.75-2.0M	Sep 24, 2019		Soil	B19-Se44540	X		
103	BH073 - 0.0-0.25M	Sep 24, 2019		Soil	B19-Se44541	X		
104	BH073 - 0.25-	Sep 24, 2019		Soil	B19-Se44542	X		

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Eurofins Analytical Services Manager : Ryan Gilbert					

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	0.5M							
105	BH073 - 0.5-0.75M	Sep 24, 2019		Soil	B19-Se44543	X	X	X
106	BH073 - 0.75-1.0M	Sep 24, 2019		Soil	B19-Se44544	X		
107	BH073 - 1.0-1.25M	Sep 24, 2019		Soil	B19-Se44545	X		
108	BH073 - 1.25-1.5M	Sep 24, 2019		Soil	B19-Se44546	X		
109	BH073 - 1.5-1.75M	Sep 24, 2019		Soil	B19-Se44547	X		
110	BH073 - 1.75-2.0M	Sep 24, 2019		Soil	B19-Se44548	X	X	X
Test Counts						110	28	28

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test				Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery									
Chromium Suite (SKCI)									
Chromium Reducible Sulfur				%	97		70-130	Pass	
Acid Neutralising Capacity (ANCbt)				%	95		70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	B19-Se44440	CP	%	5.5	5.6	2.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chromium Suite (SKCI)									
pH-KCL	B19-Se44469	CP	pH Units	4.6	4.6	<1	30%	Pass	
Acid trail - Titratable Actual Acidity	B19-Se44469	CP	mol H+/t	37	37	1.6	30%	Pass	
sulfidic - TAA equiv. S% pyrite	B19-Se44469	CP	% pyrite S	0.060	0.060	2.0	30%	Pass	
Chromium Reducible Sulfur	B19-Se44469	CP	% S	< 0.005	< 0.005	<1	30%	Pass	
Chromium Reducible Sulfur -acidity units	B19-Se44469	CP	mol H+/t	< 3	< 3	<1	30%	Pass	
Sulfur - KCl Extractable	B19-Se44469	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
Net Acid soluble sulfur	B19-Se44469	CP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - acidity units	B19-Se44469	CP	mol H+/t	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	B19-Se44469	CP	% S	n/a	n/a	n/a	30%	Pass	
Acid Neutralising Capacity (ANCbt)	B19-Se44469	CP	% CaCO3	n/a	n/a	n/a	30%	Pass	
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	B19-Se44469	CP	% S	n/a	n/a	n/a	30%	Pass	
ANC Fineness Factor	B19-Se44469	CP	factor	1.5	1.5	<1	30%	Pass	
CRS Suite - Net Acidity (Sulfur Units)	B19-Se44469	CP	% S	0.06	0.06	n/a	30%	Pass	
CRS Suite - Net Acidity (Acidity Units)	B19-Se44469	CP	mol H+/t	37	37	n/a	30%	Pass	
CRS Suite - Liming Rate	B19-Se44469	CP	kg CaCO3/t	2.8	2.8	2.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Acid Sulfate Soils Field pH Test									
pH-F (Field pH test)*	B19-Se44475	CP	pH Units	7.3	7.4	pass	30%	Pass	
Reaction Ratings*	B19-Se44475	CP	comment	2.0	2.0	pass	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	B19-Se44481	CP	%	10	11	3.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chromium Suite (SKCI)									
pH-KCL	B19-Se44510	CP	pH Units	5.4	5.4	<1	30%	Pass	
Acid trail - Titratable Actual Acidity	B19-Se44510	CP	mol H+/t	10	10	1.1	30%	Pass	
sulfidic - TAA equiv. S% pyrite	B19-Se44510	CP	% pyrite S	0.020	0.020	1.0	30%	Pass	
Chromium Reducible Sulfur	B19-Se44510	CP	% S	< 0.005	< 0.005	<1	30%	Pass	
Chromium Reducible Sulfur -acidity units	B19-Se44510	CP	mol H+/t	< 3	< 3	<1	30%	Pass	
Sulfur - KCl Extractable	B19-Se44510	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
Net Acid soluble sulfur	B19-Se44510	CP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - acidity units	B19-Se44510	CP	mol H+/t	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	B19-Se44510	CP	% S	n/a	n/a	n/a	30%	Pass	
Acid Neutralising Capacity (ANCbt)	B19-Se44510	CP	% CaCO3	n/a	n/a	n/a	30%	Pass	
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	B19-Se44510	CP	% S	n/a	n/a	n/a	30%	Pass	

Duplicate								
Chromium Suite (SKCI)				Result 1	Result 2	RPD		
ANC Fineness Factor	B19-Se44510	CP	factor	1.5	1.5	<1	30%	Pass
CRS Suite - Net Acidity (Sulfur Units)	B19-Se44510	CP	% S	0.02	0.02	n/a	30%	Pass
CRS Suite - Net Acidity (Acidity Units)	B19-Se44510	CP	mol H+/t	10	10	n/a	30%	Pass
CRS Suite - Liming Rate	B19-Se44510	CP	kg CaCO3/t	< 1	< 1	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	B19-Se44518	CP	%	17	16	5.0	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se44525	CP	pH Units	5.8	5.8	pass	30%	Pass
Reaction Ratings*	B19-Se44525	CP	comment	2.0	2.0	pass	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se44545	CP	pH Units	6.0	5.9	pass	30%	Pass
Reaction Ratings*	B19-Se44545	CP	comment	1.0	1.0	pass	30%	Pass
Duplicate								
Chromium Suite (SKCI)				Result 1	Result 2	RPD		
pH-KCL	B19-Se44548	CP	pH Units	4.6	4.7	<1	30%	Pass
Acid trail - Titratable Actual Acidity	B19-Se44548	CP	mol H+/t	52	51	<1	30%	Pass
sulfidic - TAA equiv. S% pyrite	B19-Se44548	CP	% pyrite S	0.080	0.080	1.0	30%	Pass
Chromium Reducible Sulfur	B19-Se44548	CP	% S	< 0.005	< 0.005	<1	30%	Pass
Chromium Reducible Sulfur -acidity units	B19-Se44548	CP	mol H+/t	< 3	< 3	<1	30%	Pass
Sulfur - KCl Extractable	B19-Se44548	CP	% S	< 0.02	< 0.02	<1	30%	Pass
Net Acid soluble sulfur	B19-Se44548	CP	% S	n/a	n/a	n/a	30%	Pass
Net Acid soluble sulfur - acidity units	B19-Se44548	CP	mol H+/t	n/a	n/a	n/a	30%	Pass
Net Acid soluble sulfur - equivalent S% pyrite	B19-Se44548	CP	% S	n/a	n/a	n/a	30%	Pass
Acid Neutralising Capacity (ANCbt)	B19-Se44548	CP	% CaCO3	n/a	n/a	n/a	30%	Pass
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	B19-Se44548	CP	% S	n/a	n/a	n/a	30%	Pass
ANC Fineness Factor	B19-Se44548	CP	factor	1.5	1.5	<1	30%	Pass
CRS Suite - Net Acidity (Sulfur Units)	B19-Se44548	CP	% S	0.08	0.08	n/a	30%	Pass
CRS Suite - Net Acidity (Acidity Units)	B19-Se44548	CP	mol H+/t	52	51	n/a	30%	Pass
CRS Suite - Liming Rate	B19-Se44548	CP	kg CaCO3/t	3.9	3.8	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	No

Qualifier Codes/Comments

Code	Description
S01	Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO ₃) 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/m ³ in-situ soil' multiply 'reported results' x 'wet bulk density of soil in t/m ³ '
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5
S03	Acid Neutralising Capacity is only required if the pHKCl is 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
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised By

Ryan Gilbert	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](#).

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NATA Accredited
 Accreditation Number 1261
 Site Number 20794

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 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: **Mark Thomson**

Report **679867-S**
 Project name **MIBA - NORTH HARBOUR**
 Project ID **19210**
 Received Date **Sep 30, 2019**

Client Sample ID			BH048 - 0.0-0.25M	BH048 - 0.25-0.5M	BH048 - 0.5-0.75M	BH048 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44230	B19-Se44231	B19-Se44232	B19-Se44233
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.4	6.6	6.9	7.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.3	3.9	5.0	5.3
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	5.1	-	-	5.6
Acid trail - Titratable Actual Acidity	2	mol H+/t	20	-	-	12
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.030	-	-	0.020
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	-	< 3
Sulfur - KCl Extractable	0.02	% S	n/a	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	2.0
HCl Extractable Sulfur	0.02	% S	n/a	-	-	n/a
Net Acid soluble sulfur	0.02	% S	n/a	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	n/a	-	-	n/a
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	n/a	-	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	-	n/a
ANC Fineness Factor		factor	1.5	-	-	1.5
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	0.03	-	-	0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	20	-	-	12
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	1.5	-	-	< 1
<2mm Fraction	0.005	g	26	-	-	33
>2mm Fraction	0.005	g	< 0.005	-	-	< 0.005
Analysed Material	0.1	%	100	-	-	100
Extraneous Material	0.1	%	< 0.1	-	-	< 0.1
% Moisture	1	%	11	-	-	19

Client Sample ID			BH048 - 1.00-1.25M	BH048 - 1.25-1.5M	BH048 - 1.5-1.75M	BH048 - 1.75-2.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44234	B19-Se44235	B19-Se44236	B19-Se44237
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.3	7.6	7.3	7.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.2	7.6	7.5	7.3
Reaction Ratings**S05		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	6.3
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	4.0
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.010
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	-	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	-	-	-	< 0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	< 10
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	< 1
<2mm Fraction	0.005	g	-	-	-	59
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture	1	%	-	-	-	15

Client Sample ID			BH048 - 2.00-2.25M	BH048 - 2.25-2.5M	BH048 - 2.5-2.75M	BH048 - 2.75-3.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44238	B19-Se44239	B19-Se44240	B19-Se44241
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.6	8.0	8.1	8.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.4	8.3	8.2	7.0
Reaction Ratings**S05		comment	4.0	4.0	4.0	4.0

Client Sample ID			BH048 - 3.00-3.25M	BH048 - 3.25-3.5M	BH049 - 0.0-0.25M	BH049 - 0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44242	B19-Se44243	B19-Se44244	B19-Se44245
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.3	8.3	6.3	6.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.2	6.9	3.5	3.8
Reaction Ratings**S05		comment	4.0	4.0	4.0	3.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	5.1
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	17
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.030
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	-	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	-	-	-	0.03
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	17
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	1.3
<2mm Fraction	0.005	g	-	-	-	31
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture	1	%	-	-	-	11

Client Sample ID			BH049 - 0.5-0.75M	BH049 - 0.75-1.00M	BH049 - 1.00-1.25M	BH049 - 1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44246	B19-Se44247	B19-Se44248	B19-Se44249
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.9	6.9	7.3	7.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.3	5.4	6.4	6.6
Reaction Ratings**S05		comment	3.0	4.0	4.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	6.4
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	3.1
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	< 0.003
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0

Client Sample ID			BH049 - 0.5-0.75M	BH049 - 0.75-1.00M	BH049 - 1.00-1.25M	BH049 - 1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44246	B19-Se44247	B19-Se44248	B19-Se44249
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	-	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	-	-	-	< 0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	< 10
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	< 1
<2mm Fraction	0.005	g	-	-	-	77
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture	1	%	-	-	-	14

Client Sample ID			BH049 - 1.5-1.75M	BH049 - 1.75-2.00M	BH049 - 2.00-2.25M	BH049 - 2.25-2.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44250	B19-Se44251	B19-Se44252	B19-Se44253
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.0	7.9	7.9	8.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.2	7.5	7.8	7.2
Reaction Ratings ^{S05}		comment	4.0	4.0	4.0	4.0

Client Sample ID			BH049 - 2.5-2.75M	BH049 - 2.75-3.00M	BH049 - 3.00-3.25M	BH049 - 3.25-3.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44254	B19-Se44255	B19-Se44256	B19-Se44257
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.0	8.1	8.1	8.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	6.9	7.0	7.1	8.1
Reaction Ratings ^{S05}		comment	2.0	2.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	6.4	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	3.3	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.010	-	-
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	-	< 0.02	-	-

Client Sample ID			BH049 - 2.5-2.75M	BH049 - 2.75-3.00M	BH049 - 3.00-3.25M	BH049 - 3.25-3.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44254	B19-Se44255	B19-Se44256	B19-Se44257
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	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	-	< 0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	< 1	-	-
<2mm Fraction	0.005	g	-	66	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	1	%	-	21	-	-

Client Sample ID			BH053 - 0.0-0.25M	BH053 - 0.25-0.5M	BH053 - 0.5-0.75M	BH053 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44258	B19-Se44259	B19-Se44260	B19-Se44261
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.1	6.4	6.8	7.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.2	3.7	4.7	5.1
Reaction Ratings ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	5.1	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	20	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.030	-	-	-
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	< 0.02	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-
HCl Extractable Sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	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	0.03	-	-	-

Client Sample ID			BH053 - 0.0-0.25M	BH053 - 0.25-0.5M	BH053 - 0.5-0.75M	BH053 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44258	B19-Se44259	B19-Se44260	B19-Se44261
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	20	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	1.5	-	-	-
<2mm Fraction	0.005	g	36	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture						
	1	%	12	-	-	-

Client Sample ID			BH053 - 1.00-1.25M	BH053 - 1.25-1.5M	BH053 - 1.5-1.75M	BH053 - 1.75-2.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44262	B19-Se44263	B19-Se44264	B19-Se44265
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.9	8.0	8.1	8.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.1	7.3	8.0	8.1
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	6.5	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	< 2	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	< 0.003	-	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	< 0.005	-	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	< 3	-	-
Sulfur - KCl Extractable	0.02	% S	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	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	-	< 0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	< 1	-	-
<2mm Fraction	0.005	g	-	72	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	1	%	-	17	-	-

Client Sample ID			BH053 - 2.00-2.25M	BH053 - 2.25-2.5M	BH053 - 2.5-2.75M	BH053 - 2.75-3.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44266	B19-Se44267	B19-Se44268	B19-Se44269
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.3	8.2	8.4	8.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.1	7.8	7.7	7.6
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	6.7
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	< 2
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	< 0.003
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	-	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	-	-	< 3
Sulfur - KCl Extractable	0.02	% S	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	-	0.48
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	-	-	-	95
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	-	-	-	0.15
ANC Fineness Factor		factor	-	-	-	1.5
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	-	-	-	< 0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	< 10
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	-	< 1
<2mm Fraction	0.005	g	-	-	-	74
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture	1	%	-	-	-	18

Client Sample ID			BH053 - 3.00-3.25M	BH053 - 3.25-3.5M	BH055 - 0.0-0.25M	BH055 - 0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44270	B19-Se44271	B19-Se44272	B19-Se44273
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.2	8.3	6.2	6.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.1	7.2	3.4	3.7
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	5.1	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	21	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.030	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-

Client Sample ID			BH053 - 3.00-3.25M	BH053 - 3.25-3.5M	BH055 - 0.0-0.25M	BH055 - 0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44270	B19-Se44271	B19-Se44272	B19-Se44273
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	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	-	-	0.03	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	21	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	1.6	-
<2mm Fraction	0.005	g	-	-	34	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture	1	%	-	-	12	-

Client Sample ID			BH055 - 0.5-0.75M	BH055 - 0.75-1.00M	BH055 - 1.00-1.25M	BH055 - 1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44274	B19-Se44275	B19-Se44276	B19-Se44277
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.5	7.0	7.8	7.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.9	6.1	6.5	6.6
Reaction Ratings ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	6.2	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	4.2	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.010	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	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	-	-	< 0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	< 10	-

Client Sample ID			BH055 - 0.5-0.75M	BH055 - 0.75-1.00M	BH055 - 1.00-1.25M	BH055 - 1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44274	B19-Se44275	B19-Se44276	B19-Se44277
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	< 1	-
<2mm Fraction	0.005	g	-	-	110	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture						
	1	%	-	-	21	-

Client Sample ID			BH055 - 1.5-1.75M	BH055 - 1.75-2.00M	BH055 - 2.00-2.25M	BH055 - 2.25-2.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44278	B19-Se44279	B19-Se44280	B19-Se44281
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.0	7.5	8.2	8.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.2	8.1	7.9	8.9
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	6.6	-
Acid trail - Titratable Actual Acidity	2	mol H ⁺ /t	-	-	< 2	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	< 0.003	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	-	< 0.005	-
Chromium Reducible Sulfur -acidity units	3	mol H ⁺ /t	-	-	< 3	-
Sulfur - KCl Extractable	0.02	% S	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H ⁺ /t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	0.70	-
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H ⁺ /t	-	-	140	-
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	-	-	0.22	-
ANC Fineness Factor		factor	-	-	1.5	-
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	-	-	< 0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H ⁺ /t	-	-	< 10	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	< 1	-
<2mm Fraction	0.005	g	-	-	53	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture						
	1	%	-	-	17	-

Client Sample ID			BH055 - 2.5-2.75M	BH055 - 2.75-3.00M	BH055 - 3.00-3.25M	BH055 - 3.25-3.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44282	B19-Se44283	B19-Se44284	B19-Se44285
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.5	8.4	8.4	8.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.2	8.5	8.6	8.5
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	6.8	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	< 2	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	< 0.003	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	-	< 0.005	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	-	< 3	-
Sulfur - KCl Extractable	0.02	% S	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	0.38	-
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	-	-	76	-
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	-	-	0.12	-
ANC Fineness Factor		factor	-	-	1.5	-
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	-	-	< 0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	< 10	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	< 1	-
<2mm Fraction	0.005	g	-	-	47	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture	1	%	-	-	17	-

Client Sample ID			BH079 - 0.0-0.25M	BH079 - 0.25-0.5M	BH079 - 0.5-0.75M	BH079 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44286	B19-Se44287	B19-Se44288	B19-Se44289
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.8	5.7	5.1	5.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.7	4.0	3.8	3.9
Reaction Ratings* ^{S05}		comment	4.0	3.0	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.3	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	81	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.13	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-

Client Sample ID			BH079 - 0.0-0.25M	BH079 - 0.25-0.5M	BH079 - 0.5-0.75M	BH079 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44286	B19-Se44287	B19-Se44288	B19-Se44289
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	0.04	-	-
Net Acid soluble sulfur	0.02	% S	-	0.04	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	17	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	0.03	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	0.16	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	98	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	7.4	-	-
<2mm Fraction	0.005	g	-	72	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	17	-	-

Client Sample ID			BH079 - 1.00-1.25M	BH079 - 1.25-1.5M	BH079 - 1.5-1.75M	BH079 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44290	B19-Se44291	B19-Se44292	B19-Se44293
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.4	5.4	5.0	5.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.0	4.1	4.3	4.5
Reaction Ratings ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.0	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	18	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.030	-	-	-
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	< 0.02	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-
HCl Extractable Sulfur	0.02	% S	0.05	-	-	-
Net Acid soluble sulfur	0.02	% S	0.05	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	23	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	0.04	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	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	0.07	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	41	-	-	-

Client Sample ID			BH079 - 1.00-1.25M	BH079 - 1.25-1.5M	BH079 - 1.5-1.75M	BH079 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44290	B19-Se44291	B19-Se44292	B19-Se44293
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	3.1	-	-	-
<2mm Fraction	0.005	g	66	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture						
	1	%	25	-	-	-

Client Sample ID			BH080 - 0.0-0.25M	BH080 - 0.25-0.5M	BH080 - 0.5-0.75M	BH080 - 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44294	B19-Se44295	B19-Se44296	B19-Se44297
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.6	6.0	5.8	5.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.5	3.2	3.4	4.2
Reaction Ratings* ^{S05}		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.9	-	-	3.9
Acid trail - Titratable Actual Acidity	2	mol H+/t	26	-	-	14
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.040	-	-	0.020
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	-	< 3
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	2.0
HCl Extractable Sulfur	0.02	% S	n/a	-	-	< 0.02
Net Acid soluble sulfur	0.02	% S	n/a	-	-	< 0.02
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	< 10
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	< 0.02
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	n/a	-	-	n/a
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	n/a	-	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	-	n/a
ANC Fineness Factor		factor	1.5	-	-	1.5
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	0.04	-	-	0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	26	-	-	14
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	2.0	-	-	1.0
<2mm Fraction	0.005	g	38	-	-	140
>2mm Fraction	0.005	g	< 0.005	-	-	< 0.005
Analysed Material	0.1	%	100	-	-	100
Extraneous Material	0.1	%	< 0.1	-	-	< 0.1
% Moisture						
	1	%	5.9	-	-	15

Client Sample ID			BH080 - 1.0-1.25M	BH080 - 1.25-1.5M	BH081 - 0.0-0.25M	BH081 - 0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44298	B19-Se44299	B19-Se44302	B19-Se44303
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.0	6.3	5.4	5.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.1	4.7	2.9	4.2
Reaction Ratings**S05		comment	4.0	4.0	3.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	5.3	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	11	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.020	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	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	-	-	0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	11	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	< 1	-
<2mm Fraction	0.005	g	-	-	47	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture	1	%	-	-	14	-

Client Sample ID			BH081 - 0.5-0.75M	BH081 - 0.75-1.0M	BH081 - 1.0-1.25M	BH081 - 1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44304	B19-Se44305	B19-Se44306	B19-Se44307
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.7	5.6	5.6	5.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.5	4.7	4.6	4.8
Reaction Ratings**S05		comment	1.0	1.0	1.0	3.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.6	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	27	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.040	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-

Client Sample ID			BH081 - 0.5-0.75M	BH081 - 0.75-1.0M	BH081 - 1.0-1.25M	BH081 - 1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44304	B19-Se44305	B19-Se44306	B19-Se44307
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	0.04	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	27	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	2.0	-	-
<2mm Fraction	0.005	g	-	94	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	11	-	-

Client Sample ID			BH081 - 1.5-1.75M	BH081 - 1.75-2.0M	BH082 - 0.0-0.25M	BH082 - 0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44308	B19-Se44309	B19-Se44310	B19-Se44311
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.6	5.6	6.3	6.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.3	4.3	4.2	4.7
Reaction Ratings ^{S05}		comment	1.0	1.0	2.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	5.1
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	13
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.020
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	-	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	-	-	-	0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	13

Client Sample ID			BH081 - 1.5-1.75M	BH081 - 1.75-2.0M	BH082 - 0.0-0.25M	BH082 - 0.25-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44308	B19-Se44309	B19-Se44310	B19-Se44311
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	1.0
<2mm Fraction	0.005	g	-	-	-	71
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture	1	%	-	-	-	5.1

Client Sample ID			BH082 - 0.5-0.75M	BH082 - 0.75-1.0M	BH082 - 1.0-1.25M	BH082 - 1.25-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44312	B19-Se44313	B19-Se44314	B19-Se44315
Date Sampled			Sep 26, 2019	Sep 26, 2019	Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.9	5.8	5.8	5.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.8	4.8	4.7	4.7
Reaction Ratings* ^{S05}		comment	2.0	1.0	1.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	4.8
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	23
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.040
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	-	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	-	-	-	0.04
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	23
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	1.7
<2mm Fraction	0.005	g	-	-	-	97
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture	1	%	-	-	-	17

Client Sample ID			BH082 - 1.5-1.75M	BH082 - 1.75-2.0M
Sample Matrix			Soil	Soil
Eurofins Sample No.			B19-Se44316	B19-Se44317
Date Sampled			Sep 26, 2019	Sep 26, 2019
Test/Reference	LOR	Unit		
Acid Sulfate Soils Field pH Test				
pH-F (Field pH test)*	0.1	pH Units	5.7	5.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.6	4.7
Reaction Ratings* ^{S05}		comment	1.0	1.0

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

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 - Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests	Brisbane	Oct 08, 2019	7 Days
Chromium Suite (SKCI) - Method: LTM-GEN-7070	Brisbane	Oct 08, 2019	6 Week
% Moisture - Method: LTM-GEN-7080 Moisture	Brisbane	Sep 30, 2019	14 Days

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 30, 2019 9:00 AM
Address:	40A Glen Vista Place Chevalum Qld 4555	Report #:	679867	Due:	Oct 9, 2019
Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	7 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	BH048 - 0.0-0.25M	Sep 26, 2019		Soil	B19-Se44230	X	X	X
2	BH048 - 0.25-0.5M	Sep 26, 2019		Soil	B19-Se44231	X		
3	BH048 - 0.5-0.75M	Sep 26, 2019		Soil	B19-Se44232	X		
4	BH048 - 0.75-1.00M	Sep 26, 2019		Soil	B19-Se44233	X	X	X
5	BH048 - 1.00-1.25M	Sep 26, 2019		Soil	B19-Se44234	X		
6	BH048 - 1.25-	Sep 26, 2019		Soil	B19-Se44235	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
7	BH048 - 1.5-1.75M	Sep 26, 2019		Soil	B19-Se44236	X		
8	BH048 - 1.75-2.00M	Sep 26, 2019		Soil	B19-Se44237	X	X	X
9	BH048 - 2.00-2.25M	Sep 26, 2019		Soil	B19-Se44238	X		
10	BH048 - 2.25-2.5M	Sep 26, 2019		Soil	B19-Se44239	X		
11	BH048 - 2.5-2.75M	Sep 26, 2019		Soil	B19-Se44240	X		
12	BH048 - 2.75-3.00M	Sep 26, 2019		Soil	B19-Se44241	X		
13	BH048 - 3.00-	Sep 26, 2019		Soil	B19-Se44242	X		

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	3.25M							
14	BH048 - 3.25-3.5M	Sep 26, 2019		Soil	B19-Se44243	X		
15	BH049 - 0.0-0.25M	Sep 26, 2019		Soil	B19-Se44244	X		
16	BH049 - 0.25-0.5M	Sep 26, 2019		Soil	B19-Se44245	X	X	X
17	BH049 - 0.5-0.75M	Sep 26, 2019		Soil	B19-Se44246	X		
18	BH049 - 0.75-1.00M	Sep 26, 2019		Soil	B19-Se44247	X		
19	BH049 - 1.00-1.25M	Sep 26, 2019		Soil	B19-Se44248	X		
20	BH049 - 1.25-	Sep 26, 2019		Soil	B19-Se44249	X	X	X

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
21	BH049 - 1.5-1.75M	Sep 26, 2019		Soil	B19-Se44250	X		
22	BH049 - 1.75-2.00M	Sep 26, 2019		Soil	B19-Se44251	X		
23	BH049 - 2.00-2.25M	Sep 26, 2019		Soil	B19-Se44252	X		
24	BH049 - 2.25-2.5M	Sep 26, 2019		Soil	B19-Se44253	X		
25	BH049 - 2.5-2.75M	Sep 26, 2019		Soil	B19-Se44254	X		
26	BH049 - 2.75-3.00M	Sep 26, 2019		Soil	B19-Se44255	X	X	X
27	BH049 - 3.00-	Sep 26, 2019		Soil	B19-Se44256	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	3.25M							
28	BH049 - 3.25-3.5M	Sep 26, 2019		Soil	B19-Se44257	X		
29	BH053 - 0.0-0.25M	Sep 26, 2019		Soil	B19-Se44258	X	X	X
30	BH053 - 0.25-0.5M	Sep 26, 2019		Soil	B19-Se44259	X		
31	BH053 - 0.5-0.75M	Sep 26, 2019		Soil	B19-Se44260	X		
32	BH053 - 0.75-1.00M	Sep 26, 2019		Soil	B19-Se44261	X		
33	BH053 - 1.00-1.25M	Sep 26, 2019		Soil	B19-Se44262	X		
34	BH053 - 1.25-	Sep 26, 2019		Soil	B19-Se44263	X	X	X

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
35	BH053 - 1.5-1.75M	Sep 26, 2019		Soil	B19-Se44264	X		
36	BH053 - 1.75-2.00M	Sep 26, 2019		Soil	B19-Se44265	X		
37	BH053 - 2.00-2.25M	Sep 26, 2019		Soil	B19-Se44266	X		
38	BH053 - 2.25-2.5M	Sep 26, 2019		Soil	B19-Se44267	X		
39	BH053 - 2.5-2.75M	Sep 26, 2019		Soil	B19-Se44268	X		
40	BH053 - 2.75-3.00M	Sep 26, 2019		Soil	B19-Se44269	X	X	X
41	BH053 - 3.00-	Sep 26, 2019		Soil	B19-Se44270	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	3.25M							
42	BH053 - 3.25-3.5M	Sep 26, 2019		Soil	B19-Se44271	X		
43	BH055 - 0.0-0.25M	Sep 26, 2019		Soil	B19-Se44272	X	X	
44	BH055 - 0.25-0.5M	Sep 26, 2019		Soil	B19-Se44273	X		
45	BH055 - 0.5-0.75M	Sep 26, 2019		Soil	B19-Se44274	X		
46	BH055 - 0.75-1.00M	Sep 26, 2019		Soil	B19-Se44275	X		
47	BH055 - 1.00-1.25M	Sep 26, 2019		Soil	B19-Se44276	X	X	
48	BH055 - 1.25-	Sep 26, 2019		Soil	B19-Se44277	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
49	BH055 - 1.5-1.75M	Sep 26, 2019		Soil	B19-Se44278	X		
50	BH055 - 1.75-2.00M	Sep 26, 2019		Soil	B19-Se44279	X		
51	BH055 - 2.00-2.25M	Sep 26, 2019		Soil	B19-Se44280	X	X	X
52	BH055 - 2.25-2.5M	Sep 26, 2019		Soil	B19-Se44281	X		
53	BH055 - 2.5-2.75M	Sep 26, 2019		Soil	B19-Se44282	X		
54	BH055 - 2.75-3.00M	Sep 26, 2019		Soil	B19-Se44283	X		
55	BH055 - 3.00-	Sep 26, 2019		Soil	B19-Se44284	X	X	X

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 30, 2019 9:00 AM
Address:	40A Glen Vista Place Chevalum Qld 4555	Report #:	679867	Due:	Oct 9, 2019
Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	7 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	3.25M							
56	BH055 - 3.25-3.5M	Sep 26, 2019		Soil	B19-Se44285	X		
57	BH079 - 0.0-0.25M	Sep 26, 2019		Soil	B19-Se44286	X		
58	BH079 - 0.25-0.5M	Sep 26, 2019		Soil	B19-Se44287	X	X	X
59	BH079 - 0.5-0.75M	Sep 26, 2019		Soil	B19-Se44288	X		
60	BH079 - 0.75-1.00M	Sep 26, 2019		Soil	B19-Se44289	X		
61	BH079 - 1.00-1.25M	Sep 26, 2019		Soil	B19-Se44290	X	X	X
62	BH079 - 1.25-	Sep 26, 2019		Soil	B19-Se44291	X		

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 30, 2019 9:00 AM
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Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	7 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson
Eurofins Analytical Services Manager : Ryan Gilbert					

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
63	BH079 - 1.5-1.75M	Sep 26, 2019		Soil	B19-Se44292	X		
64	BH079 - 1.75-2.0M	Sep 26, 2019		Soil	B19-Se44293	X		
65	BH080 - 0.0-0.25M	Sep 26, 2019		Soil	B19-Se44294	X	X	X
66	BH080 - 0.25-0.5M	Sep 26, 2019		Soil	B19-Se44295	X		
67	BH080 - 0.5-0.75M	Sep 26, 2019		Soil	B19-Se44296	X		
68	BH080 - 0.75-1.0M	Sep 26, 2019		Soil	B19-Se44297	X	X	X
69	BH080 - 1.0-	Sep 26, 2019		Soil	B19-Se44298	X		

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 30, 2019 9:00 AM
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Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	7 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.25M							
70	BH080 - 1.25-1.5M	Sep 26, 2019		Soil	B19-Se44299	X		
71	BH080 - 1.5-1.75M	Sep 26, 2019		Soil	B19-Se44300	X		
72	BH080 - 1.75-2.0M	Sep 26, 2019		Soil	B19-Se44301	X		
73	BH081 - 0.0-0.25M	Sep 26, 2019		Soil	B19-Se44302	X	X	X
74	BH081 - 0.25-0.5M	Sep 26, 2019		Soil	B19-Se44303	X		
75	BH081 - 0.5-0.75M	Sep 26, 2019		Soil	B19-Se44304	X		
76	BH081 - 0.75-	Sep 26, 2019		Soil	B19-Se44305	X	X	X

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 30, 2019 9:00 AM
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Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	7 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.0M							
77	BH081 - 1.0-1.25M	Sep 26, 2019		Soil	B19-Se44306	X		
78	BH081 - 1.25-1.5M	Sep 26, 2019		Soil	B19-Se44307	X		
79	BH081 - 1.5-1.75M	Sep 26, 2019		Soil	B19-Se44308	X		
80	BH081 - 1.75-2.0M	Sep 26, 2019		Soil	B19-Se44309	X		
81	BH082 - 0.0-0.25M	Sep 26, 2019		Soil	B19-Se44310	X		
82	BH082 - 0.25-0.5M	Sep 26, 2019		Soil	B19-Se44311	X	X	X
83	BH082 - 0.5-	Sep 26, 2019		Soil	B19-Se44312	X		

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 30, 2019 9:00 AM
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Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	7 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson
Eurofins Analytical Services Manager : Ryan Gilbert					

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	0.75M							
84	BH082 - 0.75-1.0M	Sep 26, 2019		Soil	B19-Se44313	X		
85	BH082 - 1.0-1.25M	Sep 26, 2019		Soil	B19-Se44314	X		
86	BH082 - 1.25-1.5M	Sep 26, 2019		Soil	B19-Se44315	X	X	X
87	BH082 - 1.5-1.75M	Sep 26, 2019		Soil	B19-Se44316	X		
88	BH082 - 1.75-2.0M	Sep 26, 2019		Soil	B19-Se44317	X		
Test Counts						88	21	21

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery										
Chromium Suite (SKCI)										
Chromium Reducible Sulfur				%	99			70-130	Pass	
Acid Neutralising Capacity (ANCbt)				%	96			70-130	Pass	
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)*	B19-Se44230	CP	pH Units	6.4	6.4	pass		30%	Pass	
Reaction Ratings*	B19-Se44230	CP	comment	4.0	4.0	pass		30%	Pass	
Duplicate										
					Result 1	Result 2	RPD			
% Moisture	B19-Se44409	NCP	%	16	17	7.0		30%	Pass	
Duplicate										
Chromium Suite (SKCI)					Result 1	Result 2	RPD			
pH-KCL	B19-Se44233	CP	pH Units	5.6	5.6	<1		30%	Pass	
Acid trail - Titratable Actual Acidity	B19-Se44233	CP	mol H+/t	12	12	<1		30%	Pass	
sulfidic - TAA equiv. S% pyrite	B19-Se44233	CP	% pyrite S	0.020	0.020	1.0		30%	Pass	
Chromium Reducible Sulfur	B19-Se44233	CP	% S	< 0.005	< 0.005	<1		30%	Pass	
Chromium Reducible Sulfur -acidity units	B19-Se44233	CP	mol H+/t	< 3	< 3	<1		30%	Pass	
Sulfur - KCl Extractable	B19-Se44233	CP	% S	< 0.02	< 0.02	<1		30%	Pass	
Net Acid soluble sulfur	B19-Se44233	CP	% S	n/a	n/a	n/a		30%	Pass	
Net Acid soluble sulfur - acidity units	B19-Se44233	CP	mol H+/t	n/a	n/a	n/a		30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	B19-Se44233	CP	% S	n/a	n/a	n/a		30%	Pass	
Acid Neutralising Capacity (ANCbt)	B19-Se44233	CP	% CaCO3	n/a	n/a	n/a		30%	Pass	
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	B19-Se44233	CP	% S	n/a	n/a	n/a		30%	Pass	
ANC Fineness Factor	B19-Se44233	CP	factor	1.5	1.5	<1		30%	Pass	
CRS Suite - Net Acidity (Sulfur Units)	B19-Se44233	CP	% S	0.02	0.02	n/a		30%	Pass	
CRS Suite - Net Acidity (Acidity Units)	B19-Se44233	CP	mol H+/t	12	12	n/a		30%	Pass	
CRS Suite - Liming Rate	B19-Se44233	CP	kg CaCO3/t	< 1	< 1	<1		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test					Result 1	Result 2	RPD			
pH-F (Field pH test)*	B19-Se44240	CP	pH Units	8.1	8.2	pass		30%	Pass	
Reaction Ratings*	B19-Se44240	CP	comment	4.0	4.0	pass		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test					Result 1	Result 2	RPD			
pH-F (Field pH test)*	B19-Se44250	CP	pH Units	8.0	8.0	pass		30%	Pass	
Reaction Ratings*	B19-Se44250	CP	comment	4.0	4.0	pass		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test					Result 1	Result 2	RPD			
pH-F (Field pH test)*	B19-Se44260	CP	pH Units	6.8	6.7	pass		30%	Pass	
Reaction Ratings*	B19-Se44260	CP	comment	4.0	4.0	pass		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test					Result 1	Result 2	RPD			
pH-F (Field pH test)*	B19-Se44270	CP	pH Units	8.2	8.3	pass		30%	Pass	
Reaction Ratings*	B19-Se44270	CP	comment	4.0	4.0	pass		30%	Pass	

Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se44280	CP	pH Units	8.2	8.3	pass	30%	Pass
Reaction Ratings*	B19-Se44280	CP	comment	4.0	4.0	pass	30%	Pass
Duplicate								
Chromium Suite (SKCI)				Result 1	Result 2	RPD		
pH-KCL	B19-Se44280	CP	pH Units	6.6	6.7	<1	30%	Pass
Acid trail - Titratable Actual Acidity	B19-Se44280	CP	mol H+/t	< 2	< 2	<1	30%	Pass
sulfidic - TAA equiv. S% pyrite	B19-Se44280	CP	% pyrite S	< 0.003	< 0.003	<1	30%	Pass
Chromium Reducible Sulfur	B19-Se44280	CP	% S	< 0.005	< 0.005	<1	30%	Pass
Chromium Reducible Sulfur -acidity units	B19-Se44280	CP	mol H+/t	< 3	< 3	<1	30%	Pass
Sulfur - KCl Extractable	B19-Se44280	CP	% S	< 0.02	< 0.02	<1	30%	Pass
Net Acid soluble sulfur	B19-Se44280	CP	% S	n/a	n/a	n/a	30%	Pass
Net Acid soluble sulfur - acidity units	B19-Se44280	CP	mol H+/t	n/a	n/a	n/a	30%	Pass
Net Acid soluble sulfur - equivalent S% pyrite	B19-Se44280	CP	% S	n/a	n/a	n/a	30%	Pass
Acid Neutralising Capacity (ANCbt)	B19-Se44280	CP	% CaCO3	0.70	0.73	4.0	30%	Pass
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	B19-Se44280	CP	% S	0.22	0.23	4.0	30%	Pass
ANC Fineness Factor	B19-Se44280	CP	factor	1.5	1.5	<1	30%	Pass
CRS Suite - Net Acidity (Sulfur Units)	B19-Se44280	CP	% S	< 0.02	< 0.02	<1	30%	Pass
CRS Suite - Net Acidity (Acidity Units)	B19-Se44280	CP	mol H+/t	< 10	< 10	<1	30%	Pass
CRS Suite - Liming Rate	B19-Se44280	CP	kg CaCO3/t	< 1	< 1	<1	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se44290	CP	pH Units	5.4	5.2	pass	30%	Pass
Reaction Ratings*	B19-Se44290	CP	comment	4.0	4.0	pass	30%	Pass
Duplicate								
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD		
pH-F (Field pH test)*	B19-Se44310	CP	pH Units	6.3	6.3	pass	30%	Pass
Reaction Ratings*	B19-Se44310	CP	comment	2.0	2.0	pass	30%	Pass

Comments
Sample Integrity

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

Qualifier Codes/Comments

Code	Description
S01	Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO ₃) 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/m ³ in-situ soil' multiply 'reported results' x 'wet bulk density of soil in t/m ³ '
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5
S03	Acid Neutralising Capacity is only required if the pHKCl is 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
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised By

Ryan Gilbert	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](#).

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Tectonic Geotechnical Pty Ltd
 40A Glen Vista Place
 Chevalum
 Qld 4555



NATA Accredited
 Accreditation Number 1261
 Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: **Mark Thomson**

Report **679874-S**
 Project name **MIBA - NORTH HARBOUR**
 Project ID **19210**
 Received Date **Sep 30, 2019**

Client Sample ID			BH056 - 0.0-0.25M	BH056 - 0.25-0.5M	BH056 - 0.5-0.75M	BH056 - 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44368	B19-Se44369	B19-Se44370	B19-Se44371
Date Sampled			Sep 27, 2019	Sep 27, 2019	Sep 27, 2019	Sep 27, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.2	6.4	6.4	6.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.4	3.6	4.8	4.8
Reaction Ratings* ^{S05}		comment	3.0	2.0	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	5.4	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	15	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.020	-	-	-
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	< 0.02	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-
HCl Extractable Sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	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	0.02	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	15	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	1.1	-	-	-
<2mm Fraction	0.005	g	44	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture	1	%	12	-	-	-

Client Sample ID			BH056 - 1.0-1.25M	BH056 - 1.25-1.5M	BH056 - 1.5-1.75M	BH056 - 1.75-2.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44372	B19-Se44373	B19-Se44374	B19-Se44375
Date Sampled			Sep 27, 2019	Sep 27, 2019	Sep 27, 2019	Sep 27, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.8	5.6	5.7	5.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.9	4.7	4.8	4.6
Reaction Ratings* ^{S05}		comment	1.0	1.0	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	5.5	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	8.5	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.010	-	-	-
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	< 0.02	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-
HCl Extractable Sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	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	< 0.02	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	< 10	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	< 1	-	-	-
<2mm Fraction	0.005	g	68	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture	1	%	11	-	-	-

Client Sample ID			BH057 - 0.0-0.25M	BH057 - 0.25-0.5M	BH057 - 0.5-0.75M	BH057 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44376	B19-Se44377	B19-Se44378	B19-Se44379
Date Sampled			Sep 27, 2019	Sep 27, 2019	Sep 27, 2019	Sep 27, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.3	6.4	6.5	6.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.6	4.7	5.0	5.1
Reaction Ratings* ^{S05}		comment	3.0	3.0	3.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	5.5	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	7.5	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.010	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-

Client Sample ID			BH057 - 0.0-0.25M	BH057 - 0.25-0.5M	BH057 - 0.5-0.75M	BH057 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44376	B19-Se44377	B19-Se44378	B19-Se44379
Date Sampled			Sep 27, 2019	Sep 27, 2019	Sep 27, 2019	Sep 27, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	< 0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	< 1	-	-
<2mm Fraction	0.005	g	-	85	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	11	-	-

Client Sample ID			BH057 - 1.0-1.25M	BH057 - 1.25-1.5M	BH057 - 1.5-1.75M	BH057 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44380	B19-Se44381	B19-Se44382	B19-Se44383
Date Sampled			Sep 27, 2019	Sep 27, 2019	Sep 27, 2019	Sep 27, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.4	5.6	5.3	5.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.5	5.0	4.5	4.5
Reaction Ratings ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	5.5	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	8.3	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.010	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	< 0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	-	-

Client Sample ID			BH057 - 1.0-1.25M	BH057 - 1.25-1.5M	BH057 - 1.5-1.75M	BH057 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44380	B19-Se44381	B19-Se44382	B19-Se44383
Date Sampled			Sep 27, 2019	Sep 27, 2019	Sep 27, 2019	Sep 27, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	< 1	-	-
<2mm Fraction	0.005	g	-	75	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	1	%	-	11	-	-

Client Sample ID			BH058 - 0.0-0.25M	BH058 - 0.25-0.5M	BH058 - 0.5-0.75M	BH058 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44384	B19-Se44385	B19-Se44386	B19-Se44387
Date Sampled			Sep 27, 2019	Sep 27, 2019	Sep 27, 2019	Sep 27, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.7	5.6	5.6	5.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.2	3.6	3.9	4.5
Reaction Ratings* ^{S05}		comment	2.0	1.0	1.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	5.7	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	4.8	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.010	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	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	-	-	< 0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	< 10	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	< 1	-
<2mm Fraction	0.005	g	-	-	82	-
>2mm Fraction	0.005	g	-	-	3.7	-
Analysed Material	0.1	%	-	-	96	-
Extraneous Material	0.1	%	-	-	4.3	-
% Moisture						
	1	%	-	-	2.5	-

Client Sample ID			BH058 - 1.0-1.25M	BH058 - 1.25-1.5M	BH058 - 1.5-1.75M	BH058 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44388	B19-Se44389	B19-Se44390	B19-Se44391
Date Sampled			Sep 27, 2019	Sep 27, 2019	Sep 27, 2019	Sep 27, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.2	5.3	5.7	6.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.3	4.3	5.2	5.4
Reaction Ratings**S05		comment	2.0	2.0	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	5.1	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	11	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.020	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	-	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	-	-	0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	11	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	< 1	-
<2mm Fraction	0.005	g	-	-	91	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture	1	%	-	-	18	-

Client Sample ID			BH059 - 0.0-0.25M	BH059 - 0.25-0.5M	BH059 - 0.5-0.75M	BH059 - 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44392	B19-Se44393	B19-Se44394	B19-Se44395
Date Sampled			Sep 27, 2019	Sep 27, 2019	Sep 27, 2019	Sep 27, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.6	6.4	5.7	5.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.6	4.9	4.9	4.4
Reaction Ratings**S05		comment	1.0	1.0	1.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	4.8
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	14
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.020
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0

Client Sample ID			BH059 - 0.0-0.25M	BH059 - 0.25-0.5M	BH059 - 0.5-0.75M	BH059 - 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44392	B19-Se44393	B19-Se44394	B19-Se44395
Date Sampled			Sep 27, 2019	Sep 27, 2019	Sep 27, 2019	Sep 27, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	-	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	-	-	-	0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	14
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	-	1.0
<2mm Fraction	0.005	g	-	-	-	190
>2mm Fraction	0.005	g	-	-	-	< 0.005
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture	1	%	-	-	-	11

Client Sample ID			BH059 - 1.0-1.25M	BH059 - 1.25-1.5M	BH059 - 1.5-1.75M	BH059 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44396	B19-Se44397	B19-Se44398	B19-Se44399
Date Sampled			Sep 27, 2019	Sep 27, 2019	Sep 27, 2019	Sep 27, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.2	5.2	5.5	5.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.4	4.5	4.7	5.0
Reaction Ratings ^{S05}		comment	2.0	2.0	3.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	4.6
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	23
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	0.040
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	-	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	-	-	-	0.04
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	23

Client Sample ID			BH059 - 1.0-1.25M	BH059 - 1.25-1.5M	BH059 - 1.5-1.75M	BH059 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44396	B19-Se44397	B19-Se44398	B19-Se44399
Date Sampled			Sep 27, 2019	Sep 27, 2019	Sep 27, 2019	Sep 27, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	1.7
<2mm Fraction	0.005	g	-	-	-	89
>2mm Fraction	0.005	g	-	-	-	1.2
Analysed Material	0.1	%	-	-	-	99
Extraneous Material	0.1	%	-	-	-	1.3
% Moisture	1	%	-	-	-	14

Client Sample ID			BH060 - 0.0-0.25M	BH060 - 0.25-0.5M	BH060 - 0.5-0.75M	BH060 - 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44400	B19-Se44401	B19-Se44402	B19-Se44403
Date Sampled			Sep 27, 2019	Sep 27, 2019	Sep 27, 2019	Sep 27, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.8	5.9	5.9	5.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.0	3.4	4.2	4.4
Reaction Ratings* ^{S05}		comment	3.0	3.0	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	5.3	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	11	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.020	-	-	-
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	< 0.02	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-
HCl Extractable Sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	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	0.02	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	11	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	< 1	-	-	-
<2mm Fraction	0.005	g	70	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture	1	%	10.0	-	-	-

Client Sample ID			BH060 - 1.0-1.25M	BH060 - 1.25-1.5M	BH060 - 1.5-1.75M	BH060 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44404	B19-Se44405	B19-Se44406	B19-Se44407
Date Sampled			Sep 27, 2019	Sep 27, 2019	Sep 27, 2019	Sep 27, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.4	5.3	5.4	5.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.6	4.7	4.8	4.8
Reaction Ratings* ^{S05}		comment	1.0	1.0	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.4	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	39	-	-	-
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	< 0.02	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-
HCl Extractable Sulfur	0.02	% S	0.03	-	-	-
Net Acid soluble sulfur	0.02	% S	0.03	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	15	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	0.02	-	-	-
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	0.09	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	54	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	4.1	-	-	-
<2mm Fraction	0.005	g	110	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture	1	%	17	-	-	-

Client Sample ID			BH061 - 0.0-0.25M	BH061 - 0.25-0.5M	BH061 - 0.5-0.75M	BH061 - 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44408	B19-Se44409	B19-Se44410	B19-Se44411
Date Sampled			Sep 27, 2019	Sep 27, 2019	Sep 27, 2019	Sep 27, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.7	5.7	5.3	5.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.0	3.5	4.3	4.4
Reaction Ratings* ^{S05}		comment	3.0	3.0	2.0	2.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.5	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	41	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.070	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-

Client Sample ID			BH061 - 0.0-0.25M	BH061 - 0.25-0.5M	BH061 - 0.5-0.75M	BH061 - 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44408	B19-Se44409	B19-Se44410	B19-Se44411
Date Sampled			Sep 27, 2019	Sep 27, 2019	Sep 27, 2019	Sep 27, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	0.02	-	-
Net Acid soluble sulfur	0.02	% S	-	0.02	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	< 10	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	< 0.02	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	0.07	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	51	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	3.8	-	-
<2mm Fraction	0.005	g	-	140	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	16	-	-

Client Sample ID			BH061 - 1.0-1.25M	BH061 - 1.25-1.5M	BH061 - 1.5-1.75M	BH061 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44412	B19-Se44413	B19-Se44414	B19-Se44415
Date Sampled			Sep 27, 2019	Sep 27, 2019	Sep 27, 2019	Sep 27, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.5	5.5	5.7	5.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.9	4.8	4.6	4.9
Reaction Ratings ^{S05}		comment	2.0	2.0	2.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.5	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	24	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.040	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	0.04	-	-
Net Acid soluble sulfur	0.02	% S	-	0.04	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	21	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	0.03	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	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	-	0.07	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	45	-	-

Client Sample ID			BH061 - 1.0-1.25M	BH061 - 1.25-1.5M	BH061 - 1.5-1.75M	BH061 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44412	B19-Se44413	B19-Se44414	B19-Se44415
Date Sampled			Sep 27, 2019	Sep 27, 2019	Sep 27, 2019	Sep 27, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	3.4	-	-
<2mm Fraction	0.005	g	-	100	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	1	%	-	22	-	-

Client Sample ID			BH074 - 0.0-0.25M	BH074 - 0.25-0.5M	BH074 - 0.5-0.75M	BH074 - 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44416	B19-Se44417	B19-Se44418	B19-Se44419
Date Sampled			Sep 27, 2019	Sep 27, 2019	Sep 27, 2019	Sep 27, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.9	6.4	6.3	5.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.1	4.1	4.0	4.7
Reaction Ratings* ^{S05}		comment	3.0	1.0	1.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	5.6	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	5.5	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.010	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	-	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	-	< 0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	< 1	-	-
<2mm Fraction	0.005	g	-	88	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	1	%	-	1.9	-	-

Client Sample ID			BH074 - 1.0-1.25M	BH074 - 1.25-1.5M	BH074 - 1.5-1.75M	BH074 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44420	B19-Se44421	B19-Se44422	B19-Se44423
Date Sampled			Sep 27, 2019	Sep 27, 2019	Sep 27, 2019	Sep 27, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.4	5.9	5.4	5.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.1	4.4	4.4	4.2
Reaction Ratings**S05		comment	2.0	2.0	2.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	5.6	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	5.7	-	-	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.010	-	-	-
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	< 0.02	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-
HCl Extractable Sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	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	< 0.02	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	< 10	-	-	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	< 1	-	-	-
<2mm Fraction	0.005	g	84	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture	1	%	8.5	-	-	-

Client Sample ID			BH075 - 0.0-0.25M	BH075 - 0.25-0.5M	BH075 - 0.5-0.75M	BH075 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44424	B19-Se44425	B19-Se44426	B19-Se44427
Date Sampled			Sep 27, 2019	Sep 27, 2019	Sep 27, 2019	Sep 27, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.8	5.9	5.7	5.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.5	4.4	4.2	4.4
Reaction Ratings**S05		comment	4.0	1.0	1.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	5.7	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	4.8	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	0.010	-
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	-	-	< 0.02	-
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	-

Client Sample ID			BH075 - 0.0-0.25M	BH075 - 0.25-0.5M	BH075 - 0.5-0.75M	BH075 - 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44424	B19-Se44425	B19-Se44426	B19-Se44427
Date Sampled			Sep 27, 2019	Sep 27, 2019	Sep 27, 2019	Sep 27, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	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	-	-	< 0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	< 10	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	< 1	-
<2mm Fraction	0.005	g	-	-	140	-
>2mm Fraction	0.005	g	-	-	< 0.005	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture	1	%	-	-	2.3	-

Client Sample ID			BH075 - 1.0-1.25M	BH075 - 1.25-1.5M	BH075 - 1.5-1.75M	BH075 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44428	B19-Se44429	B19-Se44430	B19-Se44431
Date Sampled			Sep 27, 2019	Sep 27, 2019	Sep 27, 2019	Sep 27, 2019
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.0	6.0	5.9	6.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.5	4.3	4.9	4.8
Reaction Ratings ^{S05}		comment	1.0	2.0	1.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	-	6.2
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	2.7
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	-	-	< 0.003
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	-	-	-	< 0.02
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO ₃	-	-	-	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	-	-	-	< 0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	< 10

Client Sample ID			BH075 - 1.0-1.25M	BH075 - 1.25-1.5M	BH075 - 1.5-1.75M	BH075 - 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B19-Se44428	B19-Se44429	B19-Se44430	B19-Se44431
Date Sampled			Sep 27, 2019	Sep 27, 2019	Sep 27, 2019	Sep 27, 2019
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	< 1
<2mm Fraction	0.005	g	-	-	-	130
>2mm Fraction	0.005	g	-	-	-	0.60
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	0.5
% Moisture						
	1	%	-	-	-	13

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

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 - Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests	Brisbane	Oct 01, 2019	7 Days
Chromium Suite (SKCI) - Method: LTM-GEN-7070	Brisbane	Oct 01, 2019	6 Week
% Moisture - Method: LTM-GEN-7080 Moisture	Brisbane	Sep 30, 2019	14 Days

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 30, 2019 9:00 AM
Address:	40A Glen Vista Place Chevalum Qld 4555	Report #:	679874	Due:	Oct 9, 2019
Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	7 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	BH056 - 0.0-0.25M	Sep 27, 2019		Soil	B19-Se44368	X	X	X
2	BH056 - 0.25-0.5M	Sep 27, 2019		Soil	B19-Se44369	X		
3	BH056 - 0.5-0.75M	Sep 27, 2019		Soil	B19-Se44370	X		
4	BH056 - 0.75-1.0M	Sep 27, 2019		Soil	B19-Se44371	X		
5	BH056 - 1.0-1.25M	Sep 27, 2019		Soil	B19-Se44372	X	X	X
6	BH056 - 1.25-	Sep 27, 2019		Soil	B19-Se44373	X		

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 30, 2019 9:00 AM
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Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	7 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
7	BH056 - 1.5-1.75M	Sep 27, 2019		Soil	B19-Se44374	X		
8	BH056 - 1.75-2.00M	Sep 27, 2019		Soil	B19-Se44375	X		
9	BH057 - 0.0-0.25M	Sep 27, 2019		Soil	B19-Se44376	X		
10	BH057 - 0.25-0.5M	Sep 27, 2019		Soil	B19-Se44377	X	X	X
11	BH057 - 0.5-0.75M	Sep 27, 2019		Soil	B19-Se44378	X		
12	BH057 - 0.75-1.00M	Sep 27, 2019		Soil	B19-Se44379	X		
13	BH057 - 1.0-	Sep 27, 2019		Soil	B19-Se44380	X		

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 30, 2019 9:00 AM
Address:	40A Glen Vista Place Chevalum Qld 4555	Report #:	679874	Due:	Oct 9, 2019
Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	7 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.25M							
14	BH057 - 1.25-1.5M	Sep 27, 2019		Soil	B19-Se44381	X	X	X
15	BH057 - 1.5-1.75M	Sep 27, 2019		Soil	B19-Se44382	X		
16	BH057 - 1.75-2.0M	Sep 27, 2019		Soil	B19-Se44383	X		
17	BH058 - 0.0-0.25M	Sep 27, 2019		Soil	B19-Se44384	X		
18	BH058 - 0.25-0.5M	Sep 27, 2019		Soil	B19-Se44385	X		
19	BH058 - 0.5-0.75M	Sep 27, 2019		Soil	B19-Se44386	X	X	X
20	BH058 - 0.75-	Sep 27, 2019		Soil	B19-Se44387	X		

Company Name:	Tectonic Geotechnical Pty Ltd	Order No.:		Received:	Sep 30, 2019 9:00 AM
Address:	40A Glen Vista Place Chevalum Qld 4555	Report #:	679874	Due:	Oct 9, 2019
Project Name:	MIBA - NORTH HARBOUR	Phone:	07 5478 9642	Priority:	7 Day
Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.00M							
21	BH058 - 1.0-1.25M	Sep 27, 2019		Soil	B19-Se44388	X		
22	BH058 - 1.25-1.5M	Sep 27, 2019		Soil	B19-Se44389	X		
23	BH058 - 1.5-1.75M	Sep 27, 2019		Soil	B19-Se44390	X	X	X
24	BH058 - 1.75-2.0M	Sep 27, 2019		Soil	B19-Se44391	X		
25	BH059 - 0.0-0.25M	Sep 27, 2019		Soil	B19-Se44392	X		
26	BH059 - 0.25-0.5M	Sep 27, 2019		Soil	B19-Se44393	X		
27	BH059 - 0.5-	Sep 27, 2019		Soil	B19-Se44394	X		

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	0.75M							
28	BH059 - 0.75-1.0M	Sep 27, 2019		Soil	B19-Se44395	X	X	X
29	BH059 - 1.0-1.25M	Sep 27, 2019		Soil	B19-Se44396	X		
30	BH059 - 1.25-1.5M	Sep 27, 2019		Soil	B19-Se44397	X		
31	BH059 - 1.5-1.75M	Sep 27, 2019		Soil	B19-Se44398	X		
32	BH059 - 1.75-2.0M	Sep 27, 2019		Soil	B19-Se44399	X	X	X
33	BH060 - 0.0-0.25M	Sep 27, 2019		Soil	B19-Se44400	X	X	X
34	BH060 - 0.25-	Sep 27, 2019		Soil	B19-Se44401	X		

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	0.5M							
35	BH060 - 0.5-0.75M	Sep 27, 2019		Soil	B19-Se44402	X		
36	BH060 - 0.75-1.0M	Sep 27, 2019		Soil	B19-Se44403	X		
37	BH060 - 1.0-1.25M	Sep 27, 2019		Soil	B19-Se44404	X	X	X
38	BH060 - 1.25-1.5M	Sep 27, 2019		Soil	B19-Se44405	X		
39	BH060 - 1.5-1.75M	Sep 27, 2019		Soil	B19-Se44406	X		
40	BH060 - 1.75-2.0M	Sep 27, 2019		Soil	B19-Se44407	X		
41	BH061 - 0.0-	Sep 27, 2019		Soil	B19-Se44408	X		

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	0.25M							
42	BH061 - 0.25-0.5M	Sep 27, 2019		Soil	B19-Se44409	X	X	X
43	BH061 - 0.5-0.75M	Sep 27, 2019		Soil	B19-Se44410	X		
44	BH061 - 0.75-1.0M	Sep 27, 2019		Soil	B19-Se44411	X		
45	BH061 - 1.0-1.25M	Sep 27, 2019		Soil	B19-Se44412	X		
46	BH061 - 1.25-1.5M	Sep 27, 2019		Soil	B19-Se44413	X	X	X
47	BH061 - 1.5-1.75M	Sep 27, 2019		Soil	B19-Se44414	X		
48	BH061 - 1.75-	Sep 27, 2019		Soil	B19-Se44415	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	2.0M							
49	BH074 - 0.0-0.25M	Sep 27, 2019		Soil	B19-Se44416	X		
50	BH074 - 0.25-0.5M	Sep 27, 2019		Soil	B19-Se44417	X	X	X
51	BH074 - 0.5-0.75M	Sep 27, 2019		Soil	B19-Se44418	X		
52	BH074 - 0.75-1.0M	Sep 27, 2019		Soil	B19-Se44419	X		
53	BH074 - 1.0-1.25M	Sep 27, 2019		Soil	B19-Se44420	X	X	X
54	BH074 - 1.25-1.5M	Sep 27, 2019		Soil	B19-Se44421	X		
55	BH074 - 1.5-	Sep 27, 2019		Soil	B19-Se44422	X		

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Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.75M							
56	BH074 - 1.75-2.0M	Sep 27, 2019		Soil	B19-Se44423	X		
57	BH075 - 0.0-0.25M	Sep 27, 2019		Soil	B19-Se44424	X		
58	BH075 - 0.25-0.5M	Sep 27, 2019		Soil	B19-Se44425	X		
59	BH075 - 0.5-0.75M	Sep 27, 2019		Soil	B19-Se44426	X	X	X
60	BH075 - 0.75-1.00M	Sep 27, 2019		Soil	B19-Se44427	X		
61	BH075 - 1.0-1.25M	Sep 27, 2019		Soil	B19-Se44428	X		
62	BH075 - 1.25-	Sep 27, 2019		Soil	B19-Se44429	X		

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Project ID:	19210	Fax:		Contact Name:	Mark Thomson

Eurofins Analytical Services Manager : Ryan Gilbert

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set	Chromium Suite (SKCI)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.5M							
63	BH075 - 1.5-1.75M	Sep 27, 2019		Soil	B19-Se44430	X		
64	BH075 - 1.75-2.0M	Sep 27, 2019		Soil	B19-Se44431	X	X	X
Test Counts						64	16	16

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery										
Chromium Suite (SKCI)										
Chromium Reducible Sulfur				%	98			70-130	Pass	
Acid Neutralising Capacity (ANCbt)				%	97			70-130	Pass	
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)*	B19-Se44368	CP	pH Units	6.2	6.2	pass		30%	Pass	
Reaction Ratings*	B19-Se44368	CP	comment	3.0	3.0	pass		30%	Pass	
Duplicate										
Chromium Suite (SKCI)					Result 1	Result 2	RPD			
pH-KCL	B19-Se44386	CP	pH Units	5.7	5.7	<1		30%	Pass	
Acid trail - Titratable Actual Acidity	B19-Se44386	CP	mol H+/t	4.8	4.9	1.9		30%	Pass	
sulfidic - TAA equiv. S% pyrite	B19-Se44386	CP	% pyrite S	0.010	0.010	2.0		30%	Pass	
Chromium Reducible Sulfur	B19-Se44386	CP	% S	< 0.005	< 0.005	<1		30%	Pass	
Chromium Reducible Sulfur -acidity units	B19-Se44386	CP	mol H+/t	< 3	< 3	<1		30%	Pass	
Sulfur - KCl Extractable	B19-Se44386	CP	% S	< 0.02	< 0.02	<1		30%	Pass	
Net Acid soluble sulfur	B19-Se44386	CP	% S	n/a	n/a	n/a		30%	Pass	
Net Acid soluble sulfur - acidity units	B19-Se44386	CP	mol H+/t	n/a	n/a	n/a		30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	B19-Se44386	CP	% S	n/a	n/a	n/a		30%	Pass	
Acid Neutralising Capacity (ANCbt)	B19-Se44386	CP	% CaCO3	n/a	n/a	n/a		30%	Pass	
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	B19-Se44386	CP	% S	n/a	n/a	n/a		30%	Pass	
ANC Fineness Factor	B19-Se44386	CP	factor	1.5	1.5	<1		30%	Pass	
CRS Suite - Net Acidity (Sulfur Units)	B19-Se44386	CP	% S	< 0.02	< 0.02	<1		30%	Pass	
CRS Suite - Net Acidity (Acidity Units)	B19-Se44386	CP	mol H+/t	< 10	< 10	<1		30%	Pass	
CRS Suite - Liming Rate	B19-Se44386	CP	kg CaCO3/t	< 1	< 1	<1		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test					Result 1	Result 2	RPD			
pH-F (Field pH test)*	B19-Se44398	CP	pH Units	5.5	5.6	pass		30%	Pass	
Reaction Ratings*	B19-Se44398	CP	comment	3.0	3.0	pass		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test					Result 1	Result 2	RPD			
pH-F (Field pH test)*	B19-Se44408	CP	pH Units	5.7	5.7	pass		30%	Pass	
Reaction Ratings*	B19-Se44408	CP	comment	3.0	3.0	pass		30%	Pass	
Duplicate										
Acid Sulfate Soils Field pH Test					Result 1	Result 2	RPD			
% Moisture	B19-Se44409	CP	%	16	17	7.0		30%	Pass	
Duplicate										
Chromium Suite (SKCI)					Result 1	Result 2	RPD			
pH-KCL	B19-Se44426	CP	pH Units	5.7	5.7	<1		30%	Pass	
Acid trail - Titratable Actual Acidity	B19-Se44426	CP	mol H+/t	4.8	4.6	5.1		30%	Pass	
sulfidic - TAA equiv. S% pyrite	B19-Se44426	CP	% pyrite S	0.010	0.010	5.0		30%	Pass	
Chromium Reducible Sulfur	B19-Se44426	CP	% S	< 0.005	< 0.005	<1		30%	Pass	
Chromium Reducible Sulfur -acidity units	B19-Se44426	CP	mol H+/t	< 3	< 3	<1		30%	Pass	
Sulfur - KCl Extractable	B19-Se44426	CP	% S	< 0.02	< 0.02	<1		30%	Pass	
Net Acid soluble sulfur	B19-Se44426	CP	% S	n/a	n/a	n/a		30%	Pass	

Duplicate								
Chromium Suite (SKCI)				Result 1	Result 2	RPD		
Net Acid soluble sulfur - acidity units	B19-Se44426	CP	mol H+/t	n/a	n/a	n/a	30%	Pass
Net Acid soluble sulfur - equivalent S% pyrite	B19-Se44426	CP	% S	n/a	n/a	n/a	30%	Pass
Acid Neutralising Capacity (ANCbt)	B19-Se44426	CP	% CaCO3	n/a	n/a	n/a	30%	Pass
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	B19-Se44426	CP	% S	n/a	n/a	n/a	30%	Pass
ANC Fineness Factor	B19-Se44426	CP	factor	1.5	1.5	<1	30%	Pass
CRS Suite - Net Acidity (Sulfur Units)	B19-Se44426	CP	% S	< 0.02	< 0.02	<1	30%	Pass
CRS Suite - Net Acidity (Acidity Units)	B19-Se44426	CP	mol H+/t	< 10	< 10	<1	30%	Pass
CRS Suite - Liming Rate	B19-Se44426	CP	kg CaCO3/t	< 1	< 1	<1	30%	Pass

Comments
Sample Integrity

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

Qualifier Codes/Comments

Code	Description
S01	Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO3) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from 'kg/t dry weight' to 'kg/m3 in-situ soil' multiply 'reported results' x 'wet bulk density of soil in t/m3'
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5
S03	Acid Neutralising Capacity is only required if the pHKCl is 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
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised By

Ryan Gilbert	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](#).

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Certificate of Analysis

Tectonic Geotechnical Pty Ltd
40A Glen Vista Place
Chevalum
Qld 4555



NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Mark Thomson

Report 567741-S
Project name BUCKLEY-UHLMANN RD SEWER MAIN
Project ID 17348
Received Date Oct 16, 2017

Client Sample ID			BH1 0.0-0.25M	BH1 0.25-0.5M	BH1 0.50-0.75M	BH1 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B17-Oc17209	B17-Oc17210	B17-Oc17211	B17-Oc17212
Date Sampled			Oct 11, 2017	Oct 11, 2017	Oct 11, 2017	Oct 11, 2017
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.9	4.4	4.2	4.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.7	3.1	2.8	2.8
Reaction Ratings* ^{S05}		comment	3.0	2.0	1.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	4.2	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	59	-	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	0.09	-	-
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	-	0.08	-	-
HCl Extractable Sulfur	0.02	% S	-	0.09	-	-
Net Acid soluble sulfur	0.02	% S	-	< 0.02	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	< 10	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	< 0.02	-	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	n/a	-	-
Acid Neutralising Capacity - acidity (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	-	-
Net Acidity (Sulfur Units)	0.02	% S	-	0.10	-	-
Net Acidity (Acidity Units)	10	mol H+/t	-	65	-	-
Liming Rate ^{S01}	1	kg CaCO3/t	-	4.9	-	-
<2mm Fraction	0.005	g	-	160	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	26	-	-

Client Sample ID			BH1 1.00-1.25M	BH1 1.25-1.5M	BH1 1.5-1.75M	BH1 1.75-2.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B17-Oc17213	B17-Oc17214	B17-Oc17215	B17-Oc17216
Date Sampled			Oct 11, 2017	Oct 11, 2017	Oct 11, 2017	Oct 11, 2017
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.2	4.4	5.1	5.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.8	2.7	1.9	1.8
Reaction Ratings**S05		comment	1.0	1.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.1	-	-	4.4
Acid trail - Titratable Actual Acidity	2	mol H+/t	70	-	-	47
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.11	-	-	0.08
Chromium Reducible Sulfur ^{S04}	0.005	% S	0.006	-	-	2.0
Chromium Reducible Sulfur -acidity units	3	mol H+/t	4.0	-	-	1300
Sulfur - KCl Extractable	0.02	% S	0.05	-	-	0.09
HCl Extractable Sulfur	0.02	% S	0.07	-	-	0.10
Net Acid soluble sulfur	0.02	% S	< 0.02	-	-	< 0.02
Net Acid soluble sulfur - acidity units	10	mol H+/t	< 10	-	-	< 10
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	< 0.02	-	-	< 0.02
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	-	-	n/a
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	n/a	-	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	-	n/a
ANC Fineness Factor		factor	1.5	-	-	1.5
Net Acidity (Sulfur Units)	0.02	% S	0.13	-	-	2.1
Net Acidity (Acidity Units)	10	mol H+/t	79	-	-	1300
Liming Rate ^{S01}	1	kg CaCO3/t	5.9	-	-	98
<2mm Fraction	0.005	g	100	-	-	69
>2mm Fraction	0.005	g	< 0.005	-	-	< 0.005
Analysed Material	0.1	%	100	-	-	100
Extraneous Material	0.1	%	< 0.1	-	-	< 0.1
% Moisture	1	%	30	-	-	41

Client Sample ID			BH1 2.00-2.25M	BH1 2.25-2.50M	BH1 2.50-2.75M	BH1 2.75-3.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B17-Oc17217	B17-Oc17218	B17-Oc17219	B17-Oc17220
Date Sampled			Oct 11, 2017	Oct 11, 2017	Oct 11, 2017	Oct 11, 2017
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.4	6.2	6.5	6.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	1.9	1.9	1.8	1.7
Reaction Ratings**S05		comment	4.0	4.0	4.0	4.0

Client Sample ID			BH1 3.00-3.25M	BH1 3.25M-3.50M	BH1 3.50-3.75M	BH1 3.75-4.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B17-Oc17221	B17-Oc17222	B17-Oc17223	B17-Oc17224
Date Sampled			Oct 11, 2017	Oct 11, 2017	Oct 11, 2017	Oct 11, 2017
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.6	5.9	6.3	6.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	1.7	1.9	2.0	1.8
Reaction Ratings**S05		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	5.0	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	20	-	-	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.03	-	-	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	2.2	-	-	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	1400	-	-	-
Sulfur - KCl Extractable	0.02	% S	0.09	-	-	-
HCl Extractable Sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	-	-	-
Acid Neutralising Capacity - acidity (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	-	-	-
Net Acidity (Sulfur Units)	0.02	% S	2.3	-	-	-
Net Acidity (Acidity Units)	10	mol H+/t	1400	-	-	-
Liming Rate ^{S01}	1	kg CaCO3/t	110	-	-	-
<2mm Fraction	0.005	g	65	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture	1	%	40	-	-	-

Client Sample ID			BH1 4.00-4.25M	BH1 4.25-4.50M	BH1 4.50-4.75M	BH1 4.75-5.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B17-Oc17225	B17-Oc17226	B17-Oc17227	B17-Oc17228
Date Sampled			Oct 11, 2017	Oct 11, 2017	Oct 11, 2017	Oct 11, 2017
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.5	6.8	6.9	6.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	1.9	2.1	2.2	2.0
Reaction Ratings**S05		comment	4.0	4.0	4.0	4.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	-	-	5.2	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	5.0	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	-	< 0.02	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	-	0.68	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	-	420	-
Sulfur - KCl Extractable	0.02	% S	-	-	0.05	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-

Client Sample ID			BH1 4.00-4.25M	BH1 4.25-4.50M	BH1 4.50-4.75M	BH1 4.75-5.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B17-Oc17225	B17-Oc17226	B17-Oc17227	B17-Oc17228
Date Sampled			Oct 11, 2017	Oct 11, 2017	Oct 11, 2017	Oct 11, 2017
Test/Reference	LOR	Unit				
Chromium Suite (SKCI)						
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	%CaCO ₃	-	-	n/a	-
Acid Neutralising Capacity - acidity (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	-
Net Acidity (Sulfur Units)	0.02	% S	-	-	0.69	-
Net Acidity (Acidity Units)	10	mol H+/t	-	-	430	-
Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	-	32	-
<2mm Fraction	0.005	g	-	-	140	-
>2mm Fraction	0.005	g	-	-	1.9	-
Analysed Material	0.1	%	-	-	99	-
Extraneous Material	0.1	%	-	-	1.3	-
% Moisture	1	%	-	-	21	-

Client Sample ID			BH2 0.0-0.25M	BH2 0.25-0.50M	BH2 0.50-0.75M	BH2 0.75-1.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B17-Oc17229	B17-Oc17230	B17-Oc17231	B17-Oc17232
Date Sampled			Oct 09, 2017	Oct 09, 2017	Oct 09, 2017	Oct 09, 2017
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.0	4.9	4.5	4.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.6	3.2	3.7	3.7
Reaction Ratings ^{S05}		comment	3.0	1.0	1.0	1.0
Chromium Suite (SKCI)						
pH-KCL	0.1	pH Units	4.6	-	-	4.2
Acid trail - Titratable Actual Acidity	2	mol H+/t	35	-	-	55
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.06	-	-	0.09
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	-	0.007
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	-	5.0
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	-	< 0.02
HCl Extractable Sulfur	0.02	% S	n/a	-	-	< 0.02
Net Acid soluble sulfur	0.02	% S	n/a	-	-	< 0.02
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	< 10
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	< 0.02
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO ₃	n/a	-	-	n/a
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	n/a	-	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	-	n/a
ANC Fineness Factor		factor	1.5	-	-	1.5
Net Acidity (Sulfur Units)	0.02	% S	0.06	-	-	0.09
Net Acidity (Acidity Units)	10	mol H+/t	35	-	-	59
Liming Rate ^{S01}	1	kg CaCO ₃ /t	2.7	-	-	4.4
<2mm Fraction	0.005	g	95	-	-	110
>2mm Fraction	0.005	g	2.3	-	-	< 0.005

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Attention: Mark Thomson

Report 464761-S
 Project name NORTHEAST BUSINESS PARK
 Project ID GEOTKPAR01976AC
 Received Date Jul 10, 2015

Client Sample ID			TP301 0.0-0.25M	TP301 0.25-0.5M	TP301 0.5-0.75M	TP301 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09603	B15-JI09604	B15-JI09605	B15-JI09606
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.3	4.0	3.9	3.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.2	3.0	2.9	3.0
Reaction Ratings* ^{S05}		comment	3.0	2.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	4.3	-	-	4.0
Acid trail - Titratable Actual Acidity	2	mol H+/t	150	-	-	190
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.24	-	-	0.31
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	-	< 3
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	-	0.06
HCl Extractable Sulfur	0.02	% S	0.02	-	-	0.07
Net Acid soluble sulfur	0.02	% S	0.02	-	-	< 0.02
Net Acid soluble sulfur - acidity units	10	mol H+/t	10	-	-	< 10
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	0.02	-	-	< 0.02
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	-	-	n/a
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	n/a	-	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	-	n/a
ANC Fineness Factor		factor	1.5	-	-	1.5
Net Acidity (Sulfur Units)	0.02	% S	0.26	-	-	0.31
Net Acidity (Acidity Units)	10	mol H+/t	160	-	-	190
Liming Rate ^{S01}	1	kg CaCO3/t	12	-	-	15
Extraneous Material						
<2mm Fraction	0.005	g	n/a	-	-	n/a
>2mm Fraction	0.005	g	n/a	-	-	n/a
Analysed Material	0.1	%	100	-	-	100
Extraneous Material	0.1	%	< 0.1	-	-	< 0.1
% Moisture	0.1	%	23	-	-	27

Client Sample ID			TP301 1.0-1.25M	TP301 1.25-1.5M	TP301 1.5-1.75M	TP301 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09607	B15-JI09608	B15-JI09609	B15-JI09610
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	3.8	3.8	4.2	3.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.7	2.7	2.6	2.5
Reaction Ratings* ^{S05}		comment	2.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	-	4.0	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	180	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	-	0.29	-
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	-	-	0.05	-
HCl Extractable Sulfur	0.02	% S	-	-	0.05	-
Net Acid soluble sulfur	0.02	% S	-	-	< 0.02	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	< 10	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	< 0.02	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	-	n/a	-
Acid Neutralising Capacity - acidity (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	-
Net Acidity (Sulfur Units)	0.02	% S	-	-	0.29	-
Net Acidity (Acidity Units)	10	mol H+/t	-	-	180	-
Liming Rate ^{S01}	1	kg CaCO3/t	-	-	14	-
Extraneous Material						
<2mm Fraction	0.005	g	-	-	n/a	-
>2mm Fraction	0.005	g	-	-	n/a	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture	0.1	%	-	-	32	-

Client Sample ID			TP302 0.0-0.25M	TP302 0.25-0.5M	TP302 0.5-0.75M	TP302 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09611	B15-JI09612	B15-JI09613	B15-JI09614
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.8	4.5	4.4	3.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.2	3.3	3.1	2.7
Reaction Ratings* ^{S05}		comment	3.0	2.0	1.0	3.0
Chromium Suite						
pH-KCL	0.1	pH Units	4.2	-	4.2	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	160	-	190	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.25	-	0.31	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	< 0.005	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	< 3	-
Sulfur - KCl Extractable	0.02	% S	0.02	-	0.04	-
HCl Extractable Sulfur	0.02	% S	0.04	-	0.04	-

Client Sample ID			TP311 1.0-1.25M	TP311 1.25-1.5M	TP311 1.5-1.75M	TP311 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09639	B15-JI09640	B15-JI09641	B15-JI09642
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	3.8	4.4	4.5	4.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.2	2.2	2.1	1.9
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	5.4	-	4.3
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	17	-	140
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	0.03	-	0.23
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	< 0.005	-	0.006
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	< 3	-	4.0
Sulfur - KCl Extractable	0.02	% S	-	< 0.02	-	0.03
HCl Extractable Sulfur	0.02	% S	-	n/a	-	0.06
Net Acid soluble sulfur	0.02	% S	-	n/a	-	0.03
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	15
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	0.02
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	n/a	-	n/a
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	-	n/a	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	-	n/a	-	n/a
ANC Fineness Factor		factor	-	1.5	-	1.5
Net Acidity (Sulfur Units)	0.02	% S	-	0.03	-	0.26
Net Acidity (Acidity Units)	10	mol H+/t	-	17	-	160
Liming Rate ^{S01}	1	kg CaCO3/t	-	1.0	-	12
Extraneous Material						
<2mm Fraction	0.005	g	-	n/a	-	n/a
>2mm Fraction	0.005	g	-	n/a	-	n/a
Analysed Material	0.1	%	-	100	-	100
Extraneous Material	0.1	%	-	< 0.1	-	< 0.1
% Moisture	0.1	%	-	19	-	32

Client Sample ID			TP315 0.0-0.25M	TP315 0.25-0.5M	TP315 0.5-0.75M	TP315 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09643	B15-JI09644	B15-JI09645	B15-JI09646
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.5	5.0	4.4	4.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.5	3.4	3.0	3.2
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	4.2	-	-	4.2
Acid trail - Titratable Actual Acidity	2	mol H+/t	150	-	-	200
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.23	-	-	0.32
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	-	< 3
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	-	0.02
HCl Extractable Sulfur	0.02	% S	< 0.02	-	-	0.02

Client Sample ID			TP315 0.0-0.25M	TP315 0.25-0.5M	TP315 0.5-0.75M	TP315 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09643	B15-JI09644	B15-JI09645	B15-JI09646
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Chromium Suite						
Net Acid soluble sulfur	0.02	% S	< 0.02	-	-	< 0.02
Net Acid soluble sulfur - acidity units	10	mol H+/t	< 10	-	-	< 10
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	< 0.02	-	-	< 0.02
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	-	-	n/a
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	n/a	-	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	-	n/a
ANC Fineness Factor		factor	1.5	-	-	1.5
Net Acidity (Sulfur Units)	0.02	% S	0.23	-	-	0.32
Net Acidity (Acidity Units)	10	mol H+/t	150	-	-	200
Liming Rate ^{S01}	1	kg CaCO3/t	11	-	-	15
Extraneous Material						
<2mm Fraction	0.005	g	n/a	-	-	n/a
>2mm Fraction	0.005	g	n/a	-	-	n/a
Analysed Material	0.1	%	100	-	-	100
Extraneous Material	0.1	%	< 0.1	-	-	< 0.1
% Moisture						
	0.1	%	22	-	-	29

Client Sample ID			TP315 1.0-1.25M	TP315 1.25-1.5M	TP315 1.5-1.75M	TP315 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09647	B15-JI09648	B15-JI09649	B15-JI09650
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.7	4.7	5.1	4.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.1	3.2	3.5	2.9
Reaction Ratings ^{S05}		comment	1.0	1.0	3.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	-	3.9	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	120	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	-	0.19	-
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	-	-	< 0.02	-
HCl Extractable Sulfur	0.02	% S	-	-	< 0.02	-
Net Acid soluble sulfur	0.02	% S	-	-	< 0.02	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	< 10	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	< 0.02	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	-	n/a	-
Acid Neutralising Capacity - acidity (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	-
Net Acidity (Sulfur Units)	0.02	% S	-	-	0.19	-
Net Acidity (Acidity Units)	10	mol H+/t	-	-	120	-
Liming Rate ^{S01}	1	kg CaCO3/t	-	-	9.0	-

Client Sample ID			TP315 1.0-1.25M	TP315 1.25-1.5M	TP315 1.5-1.75M	TP315 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09647	B15-JI09648	B15-JI09649	B15-JI09650
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Extraneous Material						
<2mm Fraction	0.005	g	-	-	n/a	-
>2mm Fraction	0.005	g	-	-	n/a	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture						
	0.1	%	-	-	26	-

Client Sample ID			TP316 0.0-0.25M	TP316 0.25-0.5M	TP316 0.5-0.75M	TP316 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09651	B15-JI09652	B15-JI09653	B15-JI09654
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.6	5.1	5.0	5.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.6	3.9	3.8	3.4
Reaction Ratings* ^{S05}		comment	3.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	4.6	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	44	-	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	0.07	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	n/a	-	-
Acid Neutralising Capacity - acidity (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	-	-
Net Acidity (Sulfur Units)	0.02	% S	-	0.07	-	-
Net Acidity (Acidity Units)	10	mol H+/t	-	44	-	-
Liming Rate ^{S01}	1	kg CaCO3/t	-	3.0	-	-
Extraneous Material						
<2mm Fraction	0.005	g	-	n/a	-	-
>2mm Fraction	0.005	g	-	n/a	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	0.1	%	-	13	-	-

Client Sample ID			TP316 1.0-1.25M	TP316 1.25-1.5M	TP316 1.5-1.75M	TP316 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09655	B15-JI09656	B15-JI09657	B15-JI09658
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.7	5.4	5.0	5.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.3	3.8	4.1	4.4
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	4.6	-	-	4.5
Acid trail - Titratable Actual Acidity	2	mol H+/t	48	-	-	64
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.08	-	-	0.10
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	-	< 3
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	-	< 0.02
HCl Extractable Sulfur	0.02	% S	n/a	-	-	< 0.02
Net Acid soluble sulfur	0.02	% S	n/a	-	-	< 0.02
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	< 10
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	< 0.02
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO ₃	n/a	-	-	n/a
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	n/a	-	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	-	n/a
ANC Fineness Factor		factor	1.5	-	-	1.5
Net Acidity (Sulfur Units)	0.02	% S	0.08	-	-	0.11
Net Acidity (Acidity Units)	10	mol H+/t	48	-	-	66
Liming Rate ^{S01}	1	kg CaCO ₃ /t	4.0	-	-	5.0
Extraneous Material						
<2mm Fraction	0.005	g	n/a	-	-	n/a
>2mm Fraction	0.005	g	n/a	-	-	n/a
Analysed Material	0.1	%	100	-	-	100
Extraneous Material	0.1	%	< 0.1	-	-	< 0.1
% Moisture						
% Moisture	0.1	%	12	-	-	16

Client Sample ID			TP317 0.0-0.25M	TP317 0.25-0.5M	TP317 0.5-0.75M	TP317 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09659	B15-JI09660	B15-JI09661	B15-JI09662
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.1	5.3	5.5	5.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.2	3.7	4.1	4.1
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	5.9	-	4.8
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	4.0	-	27
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	< 0.02	-	0.04
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	< 0.005	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	< 3	-	< 3
Sulfur - KCl Extractable	0.02	% S	-	< 0.02	-	< 0.02
HCl Extractable Sulfur	0.02	% S	-	n/a	-	n/a

Client Sample ID			TP317 1.0-1.25M	TP317 1.25-1.5M	TP317 1.5-1.75M	TP317 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09663	B15-JI09664	B15-JI09665	B15-JI09666
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Extraneous Material						
<2mm Fraction	0.005	g	-	-	n/a	-
>2mm Fraction	0.005	g	-	-	n/a	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture						
	0.1	%	-	-	14	-

Client Sample ID			TP318 0.0-0.25M	TP318 0.25-0.5M	TP318 0.5-0.75M	TP318 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09667	B15-JI09668	B15-JI09669	B15-JI09670
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.3	5.5	5.2	5.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.1	3.5	3.6	3.6
Reaction Ratings* ^{S05}		comment	2.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	5.9	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	4.0	-	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	< 0.02	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	n/a	-	-
Acid Neutralising Capacity - acidity (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	-	-
Net Acidity (Sulfur Units)	0.02	% S	-	< 0.02	-	-
Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	-	-
Liming Rate ^{S01}	1	kg CaCO3/t	-	< 1	-	-
Extraneous Material						
<2mm Fraction	0.005	g	-	n/a	-	-
>2mm Fraction	0.005	g	-	n/a	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	0.1	%	-	7.2	-	-

Client Sample ID			TP318 1.0-1.25M	TP318 1.25-1.5M	TP318 1.5-1.75M	TP318 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09671	B15-JI09672	B15-JI09673	B15-JI09674
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.0	4.7	4.8	5.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.7	3.5	3.5	4.0
Reaction Ratings* ^{S05}		comment	1.0	2.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	4.9	-	-	4.5
Acid trail - Titratable Actual Acidity	2	mol H+/t	25	-	-	51
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.04	-	-	0.08
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	-	< 3
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	-	< 0.02
HCl Extractable Sulfur	0.02	% S	n/a	-	-	n/a
Net Acid soluble sulfur	0.02	% S	n/a	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	-	-	n/a
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	n/a	-	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	-	n/a
ANC Fineness Factor		factor	1.5	-	-	1.5
Net Acidity (Sulfur Units)	0.02	% S	0.04	-	-	0.08
Net Acidity (Acidity Units)	10	mol H+/t	25	-	-	51
Liming Rate ^{S01}	1	kg CaCO3/t	2.0	-	-	4.0
Extraneous Material						
<2mm Fraction	0.005	g	n/a	-	-	n/a
>2mm Fraction	0.005	g	n/a	-	-	n/a
Analysed Material	0.1	%	100	-	-	100
Extraneous Material	0.1	%	< 0.1	-	-	< 0.1
% Moisture						
% Moisture	0.1	%	17	-	-	17

Client Sample ID			TP319 0.0-0.25M	TP319 0.25-0.5M	TP319 0.5-0.75M	TP319 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09675	B15-JI09676	B15-JI09677	B15-JI09678
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.4	5.2	5.1	5.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.8	3.9	3.3	4.0
Reaction Ratings* ^{S05}		comment	2.0	1.0	2.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	5.4	-	4.8	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	10	-	23	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.02	-	0.04	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	< 0.005	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	< 3	-
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	< 0.02	-
HCl Extractable Sulfur	0.02	% S	n/a	-	n/a	-

Client Sample ID			TP319 0.0-0.25M	TP319 0.25-0.5M	TP319 0.5-0.75M	TP319 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09675	B15-JI09676	B15-JI09677	B15-JI09678
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Chromium Suite						
Net Acid soluble sulfur	0.02	% S	n/a	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	-	n/a	-
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	n/a	-	n/a	-
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	n/a	-
ANC Fineness Factor		factor	1.5	-	1.5	-
Net Acidity (Sulfur Units)	0.02	% S	0.02	-	0.04	-
Net Acidity (Acidity Units)	10	mol H+/t	< 10	-	23	-
Liming Rate ^{S01}	1	kg CaCO3/t	1.0	-	2.0	-
Extraneous Material						
<2mm Fraction	0.005	g	n/a	-	92	-
>2mm Fraction	0.005	g	n/a	-	10	-
Analysed Material	0.1	%	100	-	90	-
Extraneous Material	0.1	%	< 0.1	-	10	-
% Moisture						
	0.1	%	9.1	-	11	-

Client Sample ID			TP319 1.0-1.25M	TP319 1.25-1.5M	TP319 1.5-1.75M	TP319 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09679	B15-JI09680	B15-JI09681	B15-JI09682
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.9	4.9	4.8	5.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.9	4.1	4.1	4.2
Reaction Ratings ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	-	4.2	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	73	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	-	0.12	-
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	-	-	< 0.02	-
HCl Extractable Sulfur	0.02	% S	-	-	< 0.02	-
Net Acid soluble sulfur	0.02	% S	-	-	< 0.02	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	< 10	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	< 0.02	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	-	n/a	-
Acid Neutralising Capacity - acidity (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	-
Net Acidity (Sulfur Units)	0.02	% S	-	-	0.12	-
Net Acidity (Acidity Units)	10	mol H+/t	-	-	73	-
Liming Rate ^{S01}	1	kg CaCO3/t	-	-	5.0	-

Client Sample ID			TP319 1.0-1.25M	TP319 1.25-1.5M	TP319 1.5-1.75M	TP319 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09679	B15-JI09680	B15-JI09681	B15-JI09682
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Extraneous Material						
<2mm Fraction	0.005	g	-	-	90	-
>2mm Fraction	0.005	g	-	-	10	-
Analysed Material	0.1	%	-	-	90	-
Extraneous Material	0.1	%	-	-	10	-
% Moisture						
	0.1	%	-	-	17	-

Client Sample ID			TP320 0.0-0.25M	TP320 0.25-0.5M	TP320 0.5-0.75M	TP320 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09683	B15-JI09684	B15-JI09685	B15-JI09686
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.2	5.0	5.0	5.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.4	4.0	4.1	4.3
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	5.7	4.7	-	4.4
Acid trail - Titratable Actual Acidity	2	mol H+/t	4.0	27	-	66
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	< 0.02	0.04	-	0.11
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	< 0.005	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	< 3	-	< 3
Sulfur - KCl Extractable	0.02	% S	< 0.02	< 0.02	-	< 0.02
HCl Extractable Sulfur	0.02	% S	n/a	n/a	-	< 0.02
Net Acid soluble sulfur	0.02	% S	n/a	n/a	-	< 0.02
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	n/a	-	< 10
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	n/a	-	< 0.02
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	n/a	-	n/a
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	n/a	n/a	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	n/a	-	n/a
ANC Fineness Factor		factor	1.5	1.5	-	1.5
Net Acidity (Sulfur Units)	0.02	% S	< 0.02	0.04	-	0.11
Net Acidity (Acidity Units)	10	mol H+/t	< 10	27	-	66
Liming Rate ^{S01}	1	kg CaCO3/t	< 1	2.0	-	5.0
Extraneous Material						
<2mm Fraction	0.005	g	n/a	n/a	-	33
>2mm Fraction	0.005	g	n/a	n/a	-	18
Analysed Material	0.1	%	100	100	-	64
Extraneous Material	0.1	%	< 0.1	< 0.1	-	36
% Moisture						
	0.1	%	4.8	14	-	16

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Attention: Mark Thomson

Report 465062-S
 Project name NORTHEAST BUSINESS PARK
 Project ID GEOTKPAR01976AC
 Received Date Jul 13, 2015

Client Sample ID			TP304 0.0-0.25M	TP304 0.25-0.5M	TP304 0.5-0.75M	TP304 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11664	B15-JI11665	B15-JI11666	B15-JI11667
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.6	4.2	4.3	4.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.0	2.7	2.8	3.2
Reaction Ratings* ^{S05}		comment	3.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	4.4	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	160	-	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	0.25	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur	0.02	% S	-	0.06	-	-
Net Acid soluble sulfur	0.02	% S	-	0.06	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	26	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	0.04	-	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	n/a	-	-
Acid Neutralising Capacity - acidity (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	-	-
Net Acidity (Sulfur Units)	0.02	% S	-	0.29	-	-
Net Acidity (Acidity Units)	10	mol H+/t	-	180	-	-
Liming Rate ^{S01}	1	kg CaCO3/t	-	14	-	-
Extraneous Material						
<2mm Fraction	0.005	g	-	n/a	-	-
>2mm Fraction	0.005	g	-	n/a	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	0.1	%	-	26	-	-

Client Sample ID			TP304 1.0-1.25M	TP304 1.25-1.5M	TP304 1.5-1.75M	TP304 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11668	B15-JI11669	B15-JI11670	B15-JI11671
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.2	4.2	4.2	4.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.8	3.5	3.4	3.8
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	4.7	-	-	5.3
Acid trail - Titratable Actual Acidity	2	mol H+/t	59	-	-	12
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.09	-	-	0.02
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	-	< 3
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	-	< 0.02
HCl Extractable Sulfur	0.02	% S	n/a	-	-	n/a
Net Acid soluble sulfur	0.02	% S	n/a	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	-	-	n/a
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	n/a	-	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	-	n/a
ANC Fineness Factor		factor	1.5	-	-	1.5
Net Acidity (Sulfur Units)	0.02	% S	0.09	-	-	0.02
Net Acidity (Acidity Units)	10	mol H+/t	59	-	-	12
Liming Rate ^{S01}	1	kg CaCO3/t	4.0	-	-	1.0
Extraneous Material						
<2mm Fraction	0.005	g	n/a	-	-	n/a
>2mm Fraction	0.005	g	n/a	-	-	n/a
Analysed Material	0.1	%	100	-	-	100
Extraneous Material	0.1	%	< 0.1	-	-	< 0.1
% Moisture						
% Moisture	0.1	%	22	-	-	12

Client Sample ID			TP305 0.0-0.25M	TP305 0.25-0.5M	TP305 0.5-0.75M	TP305 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11672	B15-JI11673	B15-JI11674	B15-JI11675
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.9	4.7	4.8	4.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.8	3.2	3.6	3.2
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	5.1	-	4.9	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	29	-	33	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.05	-	0.05	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	< 0.005	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	< 3	-
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	< 0.02	-
HCl Extractable Sulfur	0.02	% S	n/a	-	n/a	-

Client Sample ID			TP305 0.0-0.25M	TP305 0.25-0.5M	TP305 0.5-0.75M	TP305 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11672	B15-JI11673	B15-JI11674	B15-JI11675
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Chromium Suite						
Net Acid soluble sulfur	0.02	% S	n/a	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	-	n/a	-
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	n/a	-	n/a	-
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	n/a	-
ANC Fineness Factor		factor	1.5	-	1.5	-
Net Acidity (Sulfur Units)	0.02	% S	0.05	-	0.05	-
Net Acidity (Acidity Units)	10	mol H+/t	29	-	33	-
Liming Rate ^{S01}	1	kg CaCO3/t	2.0	-	3.0	-
Extraneous Material						
<2mm Fraction	0.005	g	n/a	-	n/a	-
>2mm Fraction	0.005	g	n/a	-	n/a	-
Analysed Material	0.1	%	100	-	100	-
Extraneous Material	0.1	%	< 0.1	-	< 0.1	-
% Moisture						
	0.1	%	11	-	11	-

Client Sample ID			TP305 1.0-1.25M	TP305 1.25-1.5M	TP305 1.5-1.75M	TP305 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11676	B15-JI11677	B15-JI11678	B15-JI11679
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.4	4.6	4.4	4.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.4	3.3	3.2	3.5
Reaction Ratings ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	5.0	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	24	-	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	0.04	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	n/a	-	-
Acid Neutralising Capacity - acidity (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	-	-
Net Acidity (Sulfur Units)	0.02	% S	-	0.04	-	-
Net Acidity (Acidity Units)	10	mol H+/t	-	24	-	-
Liming Rate ^{S01}	1	kg CaCO3/t	-	2.0	-	-

Client Sample ID			TP305 1.0-1.25M	TP305 1.25-1.5M	TP305 1.5-1.75M	TP305 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11676	B15-JI11677	B15-JI11678	B15-JI11679
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Extraneous Material						
<2mm Fraction	0.005	g	-	n/a	-	-
>2mm Fraction	0.005	g	-	n/a	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	0.1	%	-	13	-	-

Client Sample ID			TP306 0.0-0.25M	TP306 0.25-0.5M	TP306 0.5-0.75M	TP306 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11680	B15-JI11681	B15-JI11682	B15-JI11683
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.4	4.9	4.5	4.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.6	3.0	3.1	3.5
Reaction Ratings* ^{S05}		comment	3.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	5.3	-	4.6
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	15	-	45
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	0.02	-	0.07
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	< 0.005	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	< 3	-	< 3
Sulfur - KCl Extractable	0.02	% S	-	< 0.02	-	< 0.02
HCl Extractable Sulfur	0.02	% S	-	n/a	-	n/a
Net Acid soluble sulfur	0.02	% S	-	n/a	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	n/a	-	n/a
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	-	n/a	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	-	n/a	-	n/a
ANC Fineness Factor		factor	-	1.5	-	1.5
Net Acidity (Sulfur Units)	0.02	% S	-	0.02	-	0.07
Net Acidity (Acidity Units)	10	mol H+/t	-	15	-	45
Liming Rate ^{S01}	1	kg CaCO3/t	-	1.0	-	3.0
Extraneous Material						
<2mm Fraction	0.005	g	-	n/a	-	n/a
>2mm Fraction	0.005	g	-	n/a	-	n/a
Analysed Material	0.1	%	-	100	-	100
Extraneous Material	0.1	%	-	< 0.1	-	< 0.1
% Moisture						
	0.1	%	-	11	-	15

Client Sample ID			TP306 1.0-1.25M	TP306 1.25-1.5M	TP306 1.5-1.75M	TP306 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11684	B15-JI11685	B15-JI11686	B15-JI11687
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.5	4.6	4.4	4.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.4	3.5	3.4	3.6
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	4.5	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	41	-	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	0.07	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	n/a	-	-
Acid Neutralising Capacity - acidity (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	-	-
Net Acidity (Sulfur Units)	0.02	% S	-	0.07	-	-
Net Acidity (Acidity Units)	10	mol H+/t	-	41	-	-
Liming Rate ^{S01}	1	kg CaCO3/t	-	3.0	-	-
Extraneous Material						
<2mm Fraction	0.005	g	-	n/a	-	-
>2mm Fraction	0.005	g	-	n/a	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
% Moisture	0.1	%	-	14	-	-

Client Sample ID			TP307 0.0-0.25M	TP307 0.25-0.5M	TP307 0.5-0.75M	TP307 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11688	B15-JI11689	B15-JI11690	B15-JI11691
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.9	4.5	4.6	4.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.6	2.5	2.8	3.2
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	4.3	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	110	-	-	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.17	-	-	-
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	< 0.02	-	-	-
HCl Extractable Sulfur	0.02	% S	< 0.02	-	-	-

Client Sample ID			TP307 0.0-0.25M	TP307 0.25-0.5M	TP307 0.5-0.75M	TP307 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11688	B15-JI11689	B15-JI11690	B15-JI11691
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Chromium Suite						
Net Acid soluble sulfur	0.02	% S	< 0.02	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	< 10	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	< 0.02	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	-	-	-
Acid Neutralising Capacity - acidity (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	-	-	-
Net Acidity (Sulfur Units)	0.02	% S	0.17	-	-	-
Net Acidity (Acidity Units)	10	mol H+/t	110	-	-	-
Liming Rate ^{S01}	1	kg CaCO3/t	8.0	-	-	-
Extraneous Material						
<2mm Fraction	0.005	g	n/a	-	-	-
>2mm Fraction	0.005	g	n/a	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture	0.1	%	25	-	-	-

Client Sample ID			TP307 1.0-1.25M	TP307 1.25-1.5M	TP307 1.5-1.75M	TP307 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11692	B15-JI11693	B15-JI11694	B15-JI11695
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.7	4.2	4.9	5.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.2	2.9	3.3	4.4
Reaction Ratings ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	4.7	-	-	5.1
Acid trail - Titratable Actual Acidity	2	mol H+/t	40	-	-	21
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.06	-	-	0.03
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	-	< 3
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	-	< 0.02
HCl Extractable Sulfur	0.02	% S	n/a	-	-	n/a
Net Acid soluble sulfur	0.02	% S	n/a	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	-	-	n/a
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	n/a	-	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	-	n/a
ANC Fineness Factor		factor	1.5	-	-	1.5
Net Acidity (Sulfur Units)	0.02	% S	0.06	-	-	0.03
Net Acidity (Acidity Units)	10	mol H+/t	40	-	-	21
Liming Rate ^{S01}	1	kg CaCO3/t	3.0	-	-	2.0

Client Sample ID			TP307 1.0-1.25M	TP307 1.25-1.5M	TP307 1.5-1.75M	TP307 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11692	B15-JI11693	B15-JI11694	B15-JI11695
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Extraneous Material						
<2mm Fraction	0.005	g	n/a	-	-	n/a
>2mm Fraction	0.005	g	n/a	-	-	n/a
Analysed Material	0.1	%	100	-	-	100
Extraneous Material	0.1	%	< 0.1	-	-	< 0.1
% Moisture						
	0.1	%	19	-	-	14

Client Sample ID			TP308 0.0-0.25M	TP308 0.25-0.5M	TP308 0.5-0.75M	TP308 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11696	B15-JI11697	B15-JI11698	B15-JI11699
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.0	4.6	5.1	4.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.7	3.5	3.1	3.5
Reaction Ratings* ^{S05}		comment	3.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	4.2	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	120	-	-	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.20	-	-	-
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	< 0.02	-	-	-
HCl Extractable Sulfur	0.02	% S	< 0.02	-	-	-
Net Acid soluble sulfur	0.02	% S	< 0.02	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	< 10	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	< 0.02	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	-	-	-
Acid Neutralising Capacity - acidity (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	-	-	-
Net Acidity (Sulfur Units)	0.02	% S	0.20	-	-	-
Net Acidity (Acidity Units)	10	mol H+/t	120	-	-	-
Liming Rate ^{S01}	1	kg CaCO3/t	9.0	-	-	-
Extraneous Material						
<2mm Fraction	0.005	g	n/a	-	-	-
>2mm Fraction	0.005	g	n/a	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture						
	0.1	%	21	-	-	-

Client Sample ID			TP308 1.0-1.25M	TP308 1.25-1.5M	TP308 1.5-1.75M	TP308 1.75-1.85M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11700	B15-JI11701	B15-JI11702	B15-JI11703
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.5	4.7	4.6	4.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.8	3.7	3.7	4.0
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	4.4	-	-	4.8
Acid trail - Titratable Actual Acidity	2	mol H+/t	68	-	-	24
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.11	-	-	0.04
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	-	< 3
Sulfur - KCl Extractable	0.02	% S	0.02	-	-	< 0.02
HCl Extractable Sulfur	0.02	% S	0.03	-	-	n/a
Net Acid soluble sulfur	0.02	% S	< 0.02	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	< 10	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	< 0.02	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	-	-	n/a
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	n/a	-	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	-	n/a
ANC Fineness Factor		factor	1.5	-	-	1.5
Net Acidity (Sulfur Units)	0.02	% S	0.11	-	-	0.04
Net Acidity (Acidity Units)	10	mol H+/t	71	-	-	24
Liming Rate ^{S01}	1	kg CaCO3/t	5.0	-	-	2.0
Extraneous Material						
<2mm Fraction	0.005	g	n/a	-	-	n/a
>2mm Fraction	0.005	g	n/a	-	-	n/a
Analysed Material	0.1	%	100	-	-	100
Extraneous Material	0.1	%	< 0.1	-	-	< 0.1
% Moisture						
% Moisture	0.1	%	17	-	-	11

Client Sample ID			TP309 0.0-0.25M	TP309 0.25-0.5M	TP309 0.5-0.75M	TP309 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11704	B15-JI11705	B15-JI11706	B15-JI11707
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.1	4.6	5.3	4.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.6	2.1	2.9	3.4
Reaction Ratings* ^{S05}		comment	3.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	4.4	-	4.5	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	120	-	62	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.19	-	0.10	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	0.008	-	< 0.005	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	5.0	-	< 3	-
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	< 0.02	-
HCl Extractable Sulfur	0.02	% S	< 0.02	-	< 0.02	-

Client Sample ID			TP309 0.0-0.25M	TP309 0.25-0.5M	TP309 0.5-0.75M	TP309 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11704	B15-JI11705	B15-JI11706	B15-JI11707
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Chromium Suite						
Net Acid soluble sulfur	0.02	% S	< 0.02	-	< 0.02	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	< 10	-	< 10	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	< 0.02	-	< 0.02	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	-	n/a	-
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	n/a	-	n/a	-
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	n/a	-
ANC Fineness Factor		factor	1.5	-	1.5	-
Net Acidity (Sulfur Units)	0.02	% S	0.19	-	0.10	-
Net Acidity (Acidity Units)	10	mol H+/t	120	-	62	-
Liming Rate ^{S01}	1	kg CaCO3/t	9.0	-	5.0	-
Extraneous Material						
<2mm Fraction	0.005	g	n/a	-	n/a	-
>2mm Fraction	0.005	g	n/a	-	n/a	-
Analysed Material	0.1	%	100	-	100	-
Extraneous Material	0.1	%	< 0.1	-	< 0.1	-
% Moisture	0.1	%	23	-	16	-

Client Sample ID			TP309 1.0-1.25M	TP309 1.25-1.5M	TP309 1.5-1.75M	TP309 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11708	B15-JI11709	B15-JI11710	B15-JI11711
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.6	4.3	4.0	4.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.5	3.0	3.7	4.4
Reaction Ratings ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	-	-	4.7
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	35
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	-	-	0.06
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	-	-	-	< 0.02
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	-	-	n/a
Acid Neutralising Capacity - acidity (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
Net Acidity (Sulfur Units)	0.02	% S	-	-	-	0.06
Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	35
Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	3.0

Client Sample ID			TP309 1.0-1.25M	TP309 1.25-1.5M	TP309 1.5-1.75M	TP309 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11708	B15-JI11709	B15-JI11710	B15-JI11711
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Extraneous Material						
<2mm Fraction	0.005	g	-	-	-	n/a
>2mm Fraction	0.005	g	-	-	-	n/a
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture						
	0.1	%	-	-	-	13

Client Sample ID			TP312 0.0-0.25M	TP312 0.25-0.5M	TP312 0.5-0.75M	TP312 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11712	B15-JI11713	B15-JI11714	B15-JI11715
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	3.8	3.7	4.8	3.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.3	2.4	2.7	2.1
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	4.1	-	4.9
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	210	-	34
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	0.33	-	0.05
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	< 0.005	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	< 3	-	< 3
Sulfur - KCl Extractable	0.02	% S	-	0.04	-	< 0.02
HCl Extractable Sulfur	0.02	% S	-	0.06	-	n/a
Net Acid soluble sulfur	0.02	% S	-	< 0.02	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	< 10	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	< 0.02	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	n/a	-	n/a
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	-	n/a	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	-	n/a	-	n/a
ANC Fineness Factor		factor	-	1.5	-	1.5
Net Acidity (Sulfur Units)	0.02	% S	-	0.34	-	0.05
Net Acidity (Acidity Units)	10	mol H+/t	-	210	-	34
Liming Rate ^{S01}	1	kg CaCO3/t	-	16	-	3.0
Extraneous Material						
<2mm Fraction	0.005	g	-	n/a	-	n/a
>2mm Fraction	0.005	g	-	n/a	-	n/a
Analysed Material	0.1	%	-	100	-	100
Extraneous Material	0.1	%	-	< 0.1	-	< 0.1
% Moisture						
	0.1	%	-	26	-	16

Client Sample ID			TP333 1.0-1.25M	TP333 1.25-1.5M	TP333 1.5-1.75M	TP333 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI08389	B15-JI08390	B15-JI08391	B15-JI08392
Date Sampled			Jul 07, 2015	Jul 07, 2015	Jul 07, 2015	Jul 07, 2015
Test/Reference	LOR	Unit				
Extraneous Material						
<2mm Fraction	0.005	g	n/a	-	-	-
>2mm Fraction	0.005	g	n/a	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture						
	0.1	%	29	-	-	-

Client Sample ID			TP334 0.0-0.25M	TP334 0.25-0.5M	TP334 0.5-0.75M	TP334 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI08393	B15-JI08394	B15-JI08395	B15-JI08396
Date Sampled			Jul 07, 2015	Jul 07, 2015	Jul 07, 2015	Jul 07, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.9	4.7	4.5	4.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.2	3.3	3.1	2.8
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	4.2	-	4.3
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	100	-	99
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	0.16	-	0.16
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	< 0.005	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	< 3	-	< 3
Sulfur - KCl Extractable	0.02	% S	-	0.02	-	0.04
HCl Extractable Sulfur	0.02	% S	-	0.03	-	0.04
Net Acid soluble sulfur	0.02	% S	-	< 0.02	-	< 0.02
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	< 10	-	< 10
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	< 0.02	-	< 0.02
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	n/a	-	n/a
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	-	n/a	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	-	n/a	-	n/a
ANC Fineness Factor		factor	-	1.5	-	1.5
Net Acidity (Sulfur Units)	0.02	% S	-	0.17	-	0.16
Net Acidity (Acidity Units)	10	mol H+/t	-	100	-	99
Liming Rate ^{S01}	1	kg CaCO3/t	-	8.0	-	7.0
Extraneous Material						
<2mm Fraction	0.005	g	-	n/a	-	n/a
>2mm Fraction	0.005	g	-	n/a	-	n/a
Analysed Material	0.1	%	-	100	-	100
Extraneous Material	0.1	%	-	< 0.1	-	< 0.1
% Moisture						
	0.1	%	-	26	-	18

Client Sample ID			TP334 1.0-1.25M	TP334 1.25-1.5M	TP334 1.5-1.75M	TP334 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI08397	B15-JI08398	B15-JI08399	B15-JI08400
Date Sampled			Jul 07, 2015	Jul 07, 2015	Jul 07, 2015	Jul 07, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.4	5.1	5.2	5.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.8	3.2	3.0	3.3
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	5.4	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	9.0	-	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	< 0.02	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	n/a	-	-
Acid Neutralising Capacity - acidity (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	-	-
Net Acidity (Sulfur Units)	0.02	% S	-	< 0.02	-	-
Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	-	-
Liming Rate ^{S01}	1	kg CaCO3/t	-	1.0	-	-
Extraneous Material						
<2mm Fraction	0.005	g	-	n/a	-	-
>2mm Fraction	0.005	g	-	n/a	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	0.1	%	-	27	-	-

Client Sample ID			TP335 0.0-0.25M	TP335 0.25-0.5M	TP335 0.5-0.75M	TP335 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI08401	B15-JI08402	B15-JI08403	B15-JI08404
Date Sampled			Jul 07, 2015	Jul 07, 2015	Jul 07, 2015	Jul 07, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.7	4.0	4.2	4.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	1.9	2.7	2.9	2.9
Reaction Ratings* ^{S05}		comment	3.0	1.0	1.0	1.0

Client Sample ID			TP335 1.0-1.25M	TP335 1.25-1.5M	TP335 1.5-1.75M	TP335 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI08405	B15-JI08406	B15-JI08407	B15-JI08408
Date Sampled			Jul 07, 2015	Jul 07, 2015	Jul 07, 2015	Jul 07, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.2	4.6	4.9	4.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.9	3.0	2.8	2.5
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0

Client Sample ID			TP336 0.0-0.25M	TP336 0.25-0.5M	TP336 0.5-0.75M	TP336 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI08409	B15-JI08410	B15-JI08411	B15-JI08412
Date Sampled			Jul 07, 2015	Jul 07, 2015	Jul 07, 2015	Jul 07, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.4	4.2	4.0	4.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.3	2.8	2.6	2.7
Reaction Ratings* ^{S05}		comment	3.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	4.2	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	170	-	-	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.28	-	-	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	0.068	-	-	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	42	-	-	-
Sulfur - KCl Extractable	0.02	% S	0.02	-	-	-
HCl Extractable Sulfur	0.02	% S	0.03	-	-	-
Net Acid soluble sulfur	0.02	% S	< 0.02	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	< 10	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	< 0.02	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	-	-	-
Acid Neutralising Capacity - acidity (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	-	-	-
Net Acidity (Sulfur Units)	0.02	% S	0.36	-	-	-
Net Acidity (Acidity Units)	10	mol H+/t	220	-	-	-
Liming Rate ^{S01}	1	kg CaCO3/t	17	-	-	-
Extraneous Material						
<2mm Fraction	0.005	g	n/a	-	-	-
>2mm Fraction	0.005	g	n/a	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture						
% Moisture	0.1	%	33	-	-	-

Client Sample ID			TP336 1.0-1.25M	TP336 1.25-1.5M	TP336 1.5-1.75M	TP336 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI08413	B15-JI08414	B15-JI08415	B15-JI08416
Date Sampled			Jul 07, 2015	Jul 07, 2015	Jul 07, 2015	Jul 07, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.5	4.5	4.4	4.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.9	2.6	2.3	2.6
Reaction Ratings* ^{S05}		comment	1.0	1.0	2.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	4.6	-	4.4
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	26	-	48
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	0.04	-	0.08
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	< 0.005	-	0.007
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	< 3	-	4.0
Sulfur - KCl Extractable	0.02	% S	-	< 0.02	-	0.03
HCl Extractable Sulfur	0.02	% S	-	n/a	-	0.03
Net Acid soluble sulfur	0.02	% S	-	n/a	-	< 0.02
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	< 10
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	< 0.02
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	n/a	-	n/a
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	-	n/a	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	-	n/a	-	n/a
ANC Fineness Factor		factor	-	1.5	-	1.5
Net Acidity (Sulfur Units)	0.02	% S	-	0.04	-	0.09
Net Acidity (Acidity Units)	10	mol H+/t	-	26	-	55
Liming Rate ^{S01}	1	kg CaCO3/t	-	2.0	-	4.0
Extraneous Material						
<2mm Fraction	0.005	g	-	n/a	-	n/a
>2mm Fraction	0.005	g	-	n/a	-	n/a
Analysed Material	0.1	%	-	100	-	100
Extraneous Material	0.1	%	-	< 0.1	-	< 0.1
% Moisture						
	0.1	%	-	29	-	34

Client Sample ID			TP337 0.0-0.25M	TP337 0.25-0.5M	TP337 0.5-0.75M	TP337 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI08417	B15-JI08418	B15-JI08419	B15-JI08420
Date Sampled			Jul 07, 2015	Jul 07, 2015	Jul 07, 2015	Jul 07, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.5	4.2	4.1	4.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.2	2.8	2.9	2.7
Reaction Ratings* ^{S05}		comment	3.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	4.1	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	120	-	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	0.20	-	-
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	-	0.05	-	-
HCl Extractable Sulfur	0.02	% S	-	0.07	-	-

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 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: Mark Thomson

Report 464761-S
 Project name NORTHEAST BUSINESS PARK
 Project ID GEOTKPAR01976AC
 Received Date Jul 10, 2015

Client Sample ID			TP301 0.0-0.25M	TP301 0.25-0.5M	TP301 0.5-0.75M	TP301 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09603	B15-JI09604	B15-JI09605	B15-JI09606
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.3	4.0	3.9	3.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.2	3.0	2.9	3.0
Reaction Ratings* ^{S05}		comment	3.0	2.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	4.3	-	-	4.0
Acid trail - Titratable Actual Acidity	2	mol H+/t	150	-	-	190
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.24	-	-	0.31
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	-	< 3
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	-	0.06
HCl Extractable Sulfur	0.02	% S	0.02	-	-	0.07
Net Acid soluble sulfur	0.02	% S	0.02	-	-	< 0.02
Net Acid soluble sulfur - acidity units	10	mol H+/t	10	-	-	< 10
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	0.02	-	-	< 0.02
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	-	-	n/a
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	n/a	-	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	-	n/a
ANC Fineness Factor		factor	1.5	-	-	1.5
Net Acidity (Sulfur Units)	0.02	% S	0.26	-	-	0.31
Net Acidity (Acidity Units)	10	mol H+/t	160	-	-	190
Liming Rate ^{S01}	1	kg CaCO3/t	12	-	-	15
Extraneous Material						
<2mm Fraction	0.005	g	n/a	-	-	n/a
>2mm Fraction	0.005	g	n/a	-	-	n/a
Analysed Material	0.1	%	100	-	-	100
Extraneous Material	0.1	%	< 0.1	-	-	< 0.1
% Moisture	0.1	%	23	-	-	27

Client Sample ID			TP301 1.0-1.25M	TP301 1.25-1.5M	TP301 1.5-1.75M	TP301 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09607	B15-JI09608	B15-JI09609	B15-JI09610
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	3.8	3.8	4.2	3.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.7	2.7	2.6	2.5
Reaction Ratings* ^{S05}		comment	2.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	-	4.0	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	180	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	-	0.29	-
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	-	-	0.05	-
HCl Extractable Sulfur	0.02	% S	-	-	0.05	-
Net Acid soluble sulfur	0.02	% S	-	-	< 0.02	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	< 10	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	< 0.02	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	-	n/a	-
Acid Neutralising Capacity - acidity (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	-
Net Acidity (Sulfur Units)	0.02	% S	-	-	0.29	-
Net Acidity (Acidity Units)	10	mol H+/t	-	-	180	-
Liming Rate ^{S01}	1	kg CaCO3/t	-	-	14	-
Extraneous Material						
<2mm Fraction	0.005	g	-	-	n/a	-
>2mm Fraction	0.005	g	-	-	n/a	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture						
% Moisture	0.1	%	-	-	32	-

Client Sample ID			TP302 0.0-0.25M	TP302 0.25-0.5M	TP302 0.5-0.75M	TP302 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09611	B15-JI09612	B15-JI09613	B15-JI09614
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.8	4.5	4.4	3.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.2	3.3	3.1	2.7
Reaction Ratings* ^{S05}		comment	3.0	2.0	1.0	3.0
Chromium Suite						
pH-KCL	0.1	pH Units	4.2	-	4.2	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	160	-	190	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.25	-	0.31	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	< 0.005	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	< 3	-
Sulfur - KCl Extractable	0.02	% S	0.02	-	0.04	-
HCl Extractable Sulfur	0.02	% S	0.04	-	0.04	-

Client Sample ID			TP311 1.0-1.25M	TP311 1.25-1.5M	TP311 1.5-1.75M	TP311 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09639	B15-JI09640	B15-JI09641	B15-JI09642
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	3.8	4.4	4.5	4.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.2	2.2	2.1	1.9
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	5.4	-	4.3
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	17	-	140
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	0.03	-	0.23
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	< 0.005	-	0.006
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	< 3	-	4.0
Sulfur - KCl Extractable	0.02	% S	-	< 0.02	-	0.03
HCl Extractable Sulfur	0.02	% S	-	n/a	-	0.06
Net Acid soluble sulfur	0.02	% S	-	n/a	-	0.03
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	15
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	0.02
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	n/a	-	n/a
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	-	n/a	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	-	n/a	-	n/a
ANC Fineness Factor		factor	-	1.5	-	1.5
Net Acidity (Sulfur Units)	0.02	% S	-	0.03	-	0.26
Net Acidity (Acidity Units)	10	mol H+/t	-	17	-	160
Liming Rate ^{S01}	1	kg CaCO3/t	-	1.0	-	12
Extraneous Material						
<2mm Fraction	0.005	g	-	n/a	-	n/a
>2mm Fraction	0.005	g	-	n/a	-	n/a
Analysed Material	0.1	%	-	100	-	100
Extraneous Material	0.1	%	-	< 0.1	-	< 0.1
% Moisture						
	0.1	%	-	19	-	32

Client Sample ID			TP315 0.0-0.25M	TP315 0.25-0.5M	TP315 0.5-0.75M	TP315 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09643	B15-JI09644	B15-JI09645	B15-JI09646
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.5	5.0	4.4	4.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.5	3.4	3.0	3.2
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	4.2	-	-	4.2
Acid trail - Titratable Actual Acidity	2	mol H+/t	150	-	-	200
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.23	-	-	0.32
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	-	< 3
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	-	0.02
HCl Extractable Sulfur	0.02	% S	< 0.02	-	-	0.02

Client Sample ID			TP315 0.0-0.25M	TP315 0.25-0.5M	TP315 0.5-0.75M	TP315 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09643	B15-JI09644	B15-JI09645	B15-JI09646
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Chromium Suite						
Net Acid soluble sulfur	0.02	% S	< 0.02	-	-	< 0.02
Net Acid soluble sulfur - acidity units	10	mol H+/t	< 10	-	-	< 10
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	< 0.02	-	-	< 0.02
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	-	-	n/a
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	n/a	-	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	-	n/a
ANC Fineness Factor		factor	1.5	-	-	1.5
Net Acidity (Sulfur Units)	0.02	% S	0.23	-	-	0.32
Net Acidity (Acidity Units)	10	mol H+/t	150	-	-	200
Liming Rate ^{S01}	1	kg CaCO3/t	11	-	-	15
Extraneous Material						
<2mm Fraction	0.005	g	n/a	-	-	n/a
>2mm Fraction	0.005	g	n/a	-	-	n/a
Analysed Material	0.1	%	100	-	-	100
Extraneous Material	0.1	%	< 0.1	-	-	< 0.1
% Moisture						
	0.1	%	22	-	-	29

Client Sample ID			TP315 1.0-1.25M	TP315 1.25-1.5M	TP315 1.5-1.75M	TP315 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09647	B15-JI09648	B15-JI09649	B15-JI09650
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.7	4.7	5.1	4.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.1	3.2	3.5	2.9
Reaction Ratings ^{S05}		comment	1.0	1.0	3.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	-	3.9	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	120	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	-	0.19	-
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	-	-	< 0.02	-
HCl Extractable Sulfur	0.02	% S	-	-	< 0.02	-
Net Acid soluble sulfur	0.02	% S	-	-	< 0.02	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	< 10	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	< 0.02	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	-	n/a	-
Acid Neutralising Capacity - acidity (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	-
Net Acidity (Sulfur Units)	0.02	% S	-	-	0.19	-
Net Acidity (Acidity Units)	10	mol H+/t	-	-	120	-
Liming Rate ^{S01}	1	kg CaCO3/t	-	-	9.0	-

Client Sample ID			TP315 1.0-1.25M	TP315 1.25-1.5M	TP315 1.5-1.75M	TP315 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09647	B15-JI09648	B15-JI09649	B15-JI09650
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Extraneous Material						
<2mm Fraction	0.005	g	-	-	n/a	-
>2mm Fraction	0.005	g	-	-	n/a	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture						
	0.1	%	-	-	26	-

Client Sample ID			TP316 0.0-0.25M	TP316 0.25-0.5M	TP316 0.5-0.75M	TP316 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09651	B15-JI09652	B15-JI09653	B15-JI09654
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.6	5.1	5.0	5.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.6	3.9	3.8	3.4
Reaction Ratings* ^{S05}		comment	3.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	4.6	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	44	-	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	0.07	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	n/a	-	-
Acid Neutralising Capacity - acidity (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	-	-
Net Acidity (Sulfur Units)	0.02	% S	-	0.07	-	-
Net Acidity (Acidity Units)	10	mol H+/t	-	44	-	-
Liming Rate ^{S01}	1	kg CaCO3/t	-	3.0	-	-
Extraneous Material						
<2mm Fraction	0.005	g	-	n/a	-	-
>2mm Fraction	0.005	g	-	n/a	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	0.1	%	-	13	-	-

Client Sample ID			TP316 1.0-1.25M	TP316 1.25-1.5M	TP316 1.5-1.75M	TP316 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09655	B15-JI09656	B15-JI09657	B15-JI09658
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.7	5.4	5.0	5.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.3	3.8	4.1	4.4
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	4.6	-	-	4.5
Acid trail - Titratable Actual Acidity	2	mol H+/t	48	-	-	64
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.08	-	-	0.10
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	-	< 3
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	-	< 0.02
HCl Extractable Sulfur	0.02	% S	n/a	-	-	< 0.02
Net Acid soluble sulfur	0.02	% S	n/a	-	-	< 0.02
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	< 10
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	< 0.02
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	-	-	n/a
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	n/a	-	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	-	n/a
ANC Fineness Factor		factor	1.5	-	-	1.5
Net Acidity (Sulfur Units)	0.02	% S	0.08	-	-	0.11
Net Acidity (Acidity Units)	10	mol H+/t	48	-	-	66
Liming Rate ^{S01}	1	kg CaCO3/t	4.0	-	-	5.0
Extraneous Material						
<2mm Fraction	0.005	g	n/a	-	-	n/a
>2mm Fraction	0.005	g	n/a	-	-	n/a
Analysed Material	0.1	%	100	-	-	100
Extraneous Material	0.1	%	< 0.1	-	-	< 0.1
% Moisture						
% Moisture	0.1	%	12	-	-	16

Client Sample ID			TP317 0.0-0.25M	TP317 0.25-0.5M	TP317 0.5-0.75M	TP317 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09659	B15-JI09660	B15-JI09661	B15-JI09662
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.1	5.3	5.5	5.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.2	3.7	4.1	4.1
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	5.9	-	4.8
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	4.0	-	27
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	< 0.02	-	0.04
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	< 0.005	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	< 3	-	< 3
Sulfur - KCl Extractable	0.02	% S	-	< 0.02	-	< 0.02
HCl Extractable Sulfur	0.02	% S	-	n/a	-	n/a

Client Sample ID			TP317 1.0-1.25M	TP317 1.25-1.5M	TP317 1.5-1.75M	TP317 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09663	B15-JI09664	B15-JI09665	B15-JI09666
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Extraneous Material						
<2mm Fraction	0.005	g	-	-	n/a	-
>2mm Fraction	0.005	g	-	-	n/a	-
Analysed Material	0.1	%	-	-	100	-
Extraneous Material	0.1	%	-	-	< 0.1	-
% Moisture						
	0.1	%	-	-	14	-

Client Sample ID			TP318 0.0-0.25M	TP318 0.25-0.5M	TP318 0.5-0.75M	TP318 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09667	B15-JI09668	B15-JI09669	B15-JI09670
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.3	5.5	5.2	5.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.1	3.5	3.6	3.6
Reaction Ratings* ^{S05}		comment	2.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	5.9	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	4.0	-	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	< 0.02	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	n/a	-	-
Acid Neutralising Capacity - acidity (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	-	-
Net Acidity (Sulfur Units)	0.02	% S	-	< 0.02	-	-
Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	-	-
Liming Rate ^{S01}	1	kg CaCO3/t	-	< 1	-	-
Extraneous Material						
<2mm Fraction	0.005	g	-	n/a	-	-
>2mm Fraction	0.005	g	-	n/a	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	0.1	%	-	7.2	-	-

Client Sample ID			TP318 1.0-1.25M	TP318 1.25-1.5M	TP318 1.5-1.75M	TP318 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09671	B15-JI09672	B15-JI09673	B15-JI09674
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.0	4.7	4.8	5.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.7	3.5	3.5	4.0
Reaction Ratings* ^{S05}		comment	1.0	2.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	4.9	-	-	4.5
Acid trail - Titratable Actual Acidity	2	mol H+/t	25	-	-	51
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.04	-	-	0.08
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	-	< 3
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	-	< 0.02
HCl Extractable Sulfur	0.02	% S	n/a	-	-	n/a
Net Acid soluble sulfur	0.02	% S	n/a	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	-	-	n/a
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	n/a	-	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	-	n/a
ANC Fineness Factor		factor	1.5	-	-	1.5
Net Acidity (Sulfur Units)	0.02	% S	0.04	-	-	0.08
Net Acidity (Acidity Units)	10	mol H+/t	25	-	-	51
Liming Rate ^{S01}	1	kg CaCO3/t	2.0	-	-	4.0
Extraneous Material						
<2mm Fraction	0.005	g	n/a	-	-	n/a
>2mm Fraction	0.005	g	n/a	-	-	n/a
Analysed Material	0.1	%	100	-	-	100
Extraneous Material	0.1	%	< 0.1	-	-	< 0.1
% Moisture						
% Moisture	0.1	%	17	-	-	17

Client Sample ID			TP319 0.0-0.25M	TP319 0.25-0.5M	TP319 0.5-0.75M	TP319 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09675	B15-JI09676	B15-JI09677	B15-JI09678
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.4	5.2	5.1	5.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.8	3.9	3.3	4.0
Reaction Ratings* ^{S05}		comment	2.0	1.0	2.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	5.4	-	4.8	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	10	-	23	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.02	-	0.04	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	< 0.005	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	< 3	-
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	< 0.02	-
HCl Extractable Sulfur	0.02	% S	n/a	-	n/a	-

Client Sample ID			TP319 0.0-0.25M	TP319 0.25-0.5M	TP319 0.5-0.75M	TP319 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09675	B15-JI09676	B15-JI09677	B15-JI09678
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Chromium Suite						
Net Acid soluble sulfur	0.02	% S	n/a	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	-	n/a	-
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	n/a	-	n/a	-
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	n/a	-
ANC Fineness Factor		factor	1.5	-	1.5	-
Net Acidity (Sulfur Units)	0.02	% S	0.02	-	0.04	-
Net Acidity (Acidity Units)	10	mol H+/t	< 10	-	23	-
Liming Rate ^{S01}	1	kg CaCO3/t	1.0	-	2.0	-
Extraneous Material						
<2mm Fraction	0.005	g	n/a	-	92	-
>2mm Fraction	0.005	g	n/a	-	10	-
Analysed Material	0.1	%	100	-	90	-
Extraneous Material	0.1	%	< 0.1	-	10	-
% Moisture						
	0.1	%	9.1	-	11	-

Client Sample ID			TP319 1.0-1.25M	TP319 1.25-1.5M	TP319 1.5-1.75M	TP319 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09679	B15-JI09680	B15-JI09681	B15-JI09682
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.9	4.9	4.8	5.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.9	4.1	4.1	4.2
Reaction Ratings ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	-	4.2	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	73	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	-	0.12	-
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	-	-	< 0.02	-
HCl Extractable Sulfur	0.02	% S	-	-	< 0.02	-
Net Acid soluble sulfur	0.02	% S	-	-	< 0.02	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	< 10	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	< 0.02	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	-	n/a	-
Acid Neutralising Capacity - acidity (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	-
Net Acidity (Sulfur Units)	0.02	% S	-	-	0.12	-
Net Acidity (Acidity Units)	10	mol H+/t	-	-	73	-
Liming Rate ^{S01}	1	kg CaCO3/t	-	-	5.0	-

Client Sample ID			TP319 1.0-1.25M	TP319 1.25-1.5M	TP319 1.5-1.75M	TP319 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09679	B15-JI09680	B15-JI09681	B15-JI09682
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Extraneous Material						
<2mm Fraction	0.005	g	-	-	90	-
>2mm Fraction	0.005	g	-	-	10	-
Analysed Material	0.1	%	-	-	90	-
Extraneous Material	0.1	%	-	-	10	-
% Moisture						
	0.1	%	-	-	17	-

Client Sample ID			TP320 0.0-0.25M	TP320 0.25-0.5M	TP320 0.5-0.75M	TP320 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI09683	B15-JI09684	B15-JI09685	B15-JI09686
Date Sampled			Jul 08, 2015	Jul 08, 2015	Jul 08, 2015	Jul 08, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.2	5.0	5.0	5.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.4	4.0	4.1	4.3
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	5.7	4.7	-	4.4
Acid trail - Titratable Actual Acidity	2	mol H+/t	4.0	27	-	66
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	< 0.02	0.04	-	0.11
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	< 0.005	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	< 3	-	< 3
Sulfur - KCl Extractable	0.02	% S	< 0.02	< 0.02	-	< 0.02
HCl Extractable Sulfur	0.02	% S	n/a	n/a	-	< 0.02
Net Acid soluble sulfur	0.02	% S	n/a	n/a	-	< 0.02
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	n/a	-	< 10
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	n/a	-	< 0.02
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	n/a	-	n/a
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	n/a	n/a	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	n/a	-	n/a
ANC Fineness Factor		factor	1.5	1.5	-	1.5
Net Acidity (Sulfur Units)	0.02	% S	< 0.02	0.04	-	0.11
Net Acidity (Acidity Units)	10	mol H+/t	< 10	27	-	66
Liming Rate ^{S01}	1	kg CaCO3/t	< 1	2.0	-	5.0
Extraneous Material						
<2mm Fraction	0.005	g	n/a	n/a	-	33
>2mm Fraction	0.005	g	n/a	n/a	-	18
Analysed Material	0.1	%	100	100	-	64
Extraneous Material	0.1	%	< 0.1	< 0.1	-	36
% Moisture						
	0.1	%	4.8	14	-	16

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Attention: Mark Thomson

Report 465062-S
 Project name NORTHEAST BUSINESS PARK
 Project ID GEOTKPAR01976AC
 Received Date Jul 13, 2015

Client Sample ID			TP304 0.0-0.25M	TP304 0.25-0.5M	TP304 0.5-0.75M	TP304 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11664	B15-JI11665	B15-JI11666	B15-JI11667
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.6	4.2	4.3	4.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.0	2.7	2.8	3.2
Reaction Ratings* ^{S05}		comment	3.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	4.4	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	160	-	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	0.25	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur	0.02	% S	-	0.06	-	-
Net Acid soluble sulfur	0.02	% S	-	0.06	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	26	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	0.04	-	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	n/a	-	-
Acid Neutralising Capacity - acidity (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	-	-
Net Acidity (Sulfur Units)	0.02	% S	-	0.29	-	-
Net Acidity (Acidity Units)	10	mol H+/t	-	180	-	-
Liming Rate ^{S01}	1	kg CaCO3/t	-	14	-	-
Extraneous Material						
<2mm Fraction	0.005	g	-	n/a	-	-
>2mm Fraction	0.005	g	-	n/a	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	0.1	%	-	26	-	-

Client Sample ID			TP304 1.0-1.25M	TP304 1.25-1.5M	TP304 1.5-1.75M	TP304 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11668	B15-JI11669	B15-JI11670	B15-JI11671
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.2	4.2	4.2	4.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.8	3.5	3.4	3.8
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	4.7	-	-	5.3
Acid trail - Titratable Actual Acidity	2	mol H+/t	59	-	-	12
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.09	-	-	0.02
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	-	< 3
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	-	< 0.02
HCl Extractable Sulfur	0.02	% S	n/a	-	-	n/a
Net Acid soluble sulfur	0.02	% S	n/a	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	-	-	n/a
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	n/a	-	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	-	n/a
ANC Fineness Factor		factor	1.5	-	-	1.5
Net Acidity (Sulfur Units)	0.02	% S	0.09	-	-	0.02
Net Acidity (Acidity Units)	10	mol H+/t	59	-	-	12
Liming Rate ^{S01}	1	kg CaCO3/t	4.0	-	-	1.0
Extraneous Material						
<2mm Fraction	0.005	g	n/a	-	-	n/a
>2mm Fraction	0.005	g	n/a	-	-	n/a
Analysed Material	0.1	%	100	-	-	100
Extraneous Material	0.1	%	< 0.1	-	-	< 0.1
% Moisture						
	0.1	%	22	-	-	12

Client Sample ID			TP305 0.0-0.25M	TP305 0.25-0.5M	TP305 0.5-0.75M	TP305 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11672	B15-JI11673	B15-JI11674	B15-JI11675
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.9	4.7	4.8	4.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.8	3.2	3.6	3.2
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	5.1	-	4.9	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	29	-	33	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.05	-	0.05	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	< 0.005	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	< 3	-
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	< 0.02	-
HCl Extractable Sulfur	0.02	% S	n/a	-	n/a	-

Client Sample ID			TP305 0.0-0.25M	TP305 0.25-0.5M	TP305 0.5-0.75M	TP305 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11672	B15-JI11673	B15-JI11674	B15-JI11675
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Chromium Suite						
Net Acid soluble sulfur	0.02	% S	n/a	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	-	n/a	-
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	n/a	-	n/a	-
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	n/a	-
ANC Fineness Factor		factor	1.5	-	1.5	-
Net Acidity (Sulfur Units)	0.02	% S	0.05	-	0.05	-
Net Acidity (Acidity Units)	10	mol H+/t	29	-	33	-
Liming Rate ^{S01}	1	kg CaCO3/t	2.0	-	3.0	-
Extraneous Material						
<2mm Fraction	0.005	g	n/a	-	n/a	-
>2mm Fraction	0.005	g	n/a	-	n/a	-
Analysed Material	0.1	%	100	-	100	-
Extraneous Material	0.1	%	< 0.1	-	< 0.1	-
% Moisture	0.1	%	11	-	11	-

Client Sample ID			TP305 1.0-1.25M	TP305 1.25-1.5M	TP305 1.5-1.75M	TP305 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11676	B15-JI11677	B15-JI11678	B15-JI11679
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.4	4.6	4.4	4.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.4	3.3	3.2	3.5
Reaction Ratings ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	5.0	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	24	-	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	0.04	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	n/a	-	-
Acid Neutralising Capacity - acidity (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	-	-
Net Acidity (Sulfur Units)	0.02	% S	-	0.04	-	-
Net Acidity (Acidity Units)	10	mol H+/t	-	24	-	-
Liming Rate ^{S01}	1	kg CaCO3/t	-	2.0	-	-

Client Sample ID			TP305 1.0-1.25M	TP305 1.25-1.5M	TP305 1.5-1.75M	TP305 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11676	B15-JI11677	B15-JI11678	B15-JI11679
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Extraneous Material						
<2mm Fraction	0.005	g	-	n/a	-	-
>2mm Fraction	0.005	g	-	n/a	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	0.1	%	-	13	-	-

Client Sample ID			TP306 0.0-0.25M	TP306 0.25-0.5M	TP306 0.5-0.75M	TP306 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11680	B15-JI11681	B15-JI11682	B15-JI11683
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.4	4.9	4.5	4.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.6	3.0	3.1	3.5
Reaction Ratings* ^{S05}		comment	3.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	5.3	-	4.6
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	15	-	45
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	0.02	-	0.07
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	< 0.005	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	< 3	-	< 3
Sulfur - KCl Extractable	0.02	% S	-	< 0.02	-	< 0.02
HCl Extractable Sulfur	0.02	% S	-	n/a	-	n/a
Net Acid soluble sulfur	0.02	% S	-	n/a	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	n/a	-	n/a
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	-	n/a	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	-	n/a	-	n/a
ANC Fineness Factor		factor	-	1.5	-	1.5
Net Acidity (Sulfur Units)	0.02	% S	-	0.02	-	0.07
Net Acidity (Acidity Units)	10	mol H+/t	-	15	-	45
Liming Rate ^{S01}	1	kg CaCO3/t	-	1.0	-	3.0
Extraneous Material						
<2mm Fraction	0.005	g	-	n/a	-	n/a
>2mm Fraction	0.005	g	-	n/a	-	n/a
Analysed Material	0.1	%	-	100	-	100
Extraneous Material	0.1	%	-	< 0.1	-	< 0.1
% Moisture						
	0.1	%	-	11	-	15

Client Sample ID			TP306 1.0-1.25M	TP306 1.25-1.5M	TP306 1.5-1.75M	TP306 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11684	B15-JI11685	B15-JI11686	B15-JI11687
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.5	4.6	4.4	4.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.4	3.5	3.4	3.6
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	4.5	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	41	-	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	0.07	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO ₃	-	n/a	-	-
Acid Neutralising Capacity - acidity (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	-	-
Net Acidity (Sulfur Units)	0.02	% S	-	0.07	-	-
Net Acidity (Acidity Units)	10	mol H+/t	-	41	-	-
Liming Rate ^{S01}	1	kg CaCO ₃ /t	-	3.0	-	-
Extraneous Material						
<2mm Fraction	0.005	g	-	n/a	-	-
>2mm Fraction	0.005	g	-	n/a	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	0.1	%	-	14	-	-

Client Sample ID			TP307 0.0-0.25M	TP307 0.25-0.5M	TP307 0.5-0.75M	TP307 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11688	B15-JI11689	B15-JI11690	B15-JI11691
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.9	4.5	4.6	4.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.6	2.5	2.8	3.2
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	4.3	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	110	-	-	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.17	-	-	-
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	< 0.02	-	-	-
HCl Extractable Sulfur	0.02	% S	< 0.02	-	-	-

Client Sample ID			TP307 0.0-0.25M	TP307 0.25-0.5M	TP307 0.5-0.75M	TP307 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11688	B15-JI11689	B15-JI11690	B15-JI11691
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Chromium Suite						
Net Acid soluble sulfur	0.02	% S	< 0.02	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	< 10	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	< 0.02	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	-	-	-
Acid Neutralising Capacity - acidity (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	-	-	-
Net Acidity (Sulfur Units)	0.02	% S	0.17	-	-	-
Net Acidity (Acidity Units)	10	mol H+/t	110	-	-	-
Liming Rate ^{S01}	1	kg CaCO3/t	8.0	-	-	-
Extraneous Material						
<2mm Fraction	0.005	g	n/a	-	-	-
>2mm Fraction	0.005	g	n/a	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture						
	0.1	%	25	-	-	-

Client Sample ID			TP307 1.0-1.25M	TP307 1.25-1.5M	TP307 1.5-1.75M	TP307 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11692	B15-JI11693	B15-JI11694	B15-JI11695
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.7	4.2	4.9	5.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.2	2.9	3.3	4.4
Reaction Ratings ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	4.7	-	-	5.1
Acid trail - Titratable Actual Acidity	2	mol H+/t	40	-	-	21
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.06	-	-	0.03
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	-	< 3
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	-	< 0.02
HCl Extractable Sulfur	0.02	% S	n/a	-	-	n/a
Net Acid soluble sulfur	0.02	% S	n/a	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	-	-	n/a
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	n/a	-	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	-	n/a
ANC Fineness Factor		factor	1.5	-	-	1.5
Net Acidity (Sulfur Units)	0.02	% S	0.06	-	-	0.03
Net Acidity (Acidity Units)	10	mol H+/t	40	-	-	21
Liming Rate ^{S01}	1	kg CaCO3/t	3.0	-	-	2.0

Client Sample ID			TP307 1.0-1.25M	TP307 1.25-1.5M	TP307 1.5-1.75M	TP307 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11692	B15-JI11693	B15-JI11694	B15-JI11695
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Extraneous Material						
<2mm Fraction	0.005	g	n/a	-	-	n/a
>2mm Fraction	0.005	g	n/a	-	-	n/a
Analysed Material	0.1	%	100	-	-	100
Extraneous Material	0.1	%	< 0.1	-	-	< 0.1
% Moisture						
	0.1	%	19	-	-	14

Client Sample ID			TP308 0.0-0.25M	TP308 0.25-0.5M	TP308 0.5-0.75M	TP308 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11696	B15-JI11697	B15-JI11698	B15-JI11699
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.0	4.6	5.1	4.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.7	3.5	3.1	3.5
Reaction Ratings* ^{S05}		comment	3.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	4.2	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	120	-	-	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.20	-	-	-
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	< 0.02	-	-	-
HCl Extractable Sulfur	0.02	% S	< 0.02	-	-	-
Net Acid soluble sulfur	0.02	% S	< 0.02	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	< 10	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	< 0.02	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	-	-	-
Acid Neutralising Capacity - acidity (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	-	-	-
Net Acidity (Sulfur Units)	0.02	% S	0.20	-	-	-
Net Acidity (Acidity Units)	10	mol H+/t	120	-	-	-
Liming Rate ^{S01}	1	kg CaCO3/t	9.0	-	-	-
Extraneous Material						
<2mm Fraction	0.005	g	n/a	-	-	-
>2mm Fraction	0.005	g	n/a	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture						
	0.1	%	21	-	-	-

Client Sample ID			TP308 1.0-1.25M	TP308 1.25-1.5M	TP308 1.5-1.75M	TP308 1.75-1.85M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11700	B15-JI11701	B15-JI11702	B15-JI11703
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.5	4.7	4.6	4.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.8	3.7	3.7	4.0
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	4.4	-	-	4.8
Acid trail - Titratable Actual Acidity	2	mol H+/t	68	-	-	24
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.11	-	-	0.04
Chromium Reducible Sulfur ^{S04}	0.005	% S	< 0.005	-	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	-	< 3
Sulfur - KCl Extractable	0.02	% S	0.02	-	-	< 0.02
HCl Extractable Sulfur	0.02	% S	0.03	-	-	n/a
Net Acid soluble sulfur	0.02	% S	< 0.02	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	< 10	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	< 0.02	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	-	-	n/a
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	n/a	-	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	-	n/a
ANC Fineness Factor		factor	1.5	-	-	1.5
Net Acidity (Sulfur Units)	0.02	% S	0.11	-	-	0.04
Net Acidity (Acidity Units)	10	mol H+/t	71	-	-	24
Liming Rate ^{S01}	1	kg CaCO3/t	5.0	-	-	2.0
Extraneous Material						
<2mm Fraction	0.005	g	n/a	-	-	n/a
>2mm Fraction	0.005	g	n/a	-	-	n/a
Analysed Material	0.1	%	100	-	-	100
Extraneous Material	0.1	%	< 0.1	-	-	< 0.1
% Moisture						
% Moisture	0.1	%	17	-	-	11

Client Sample ID			TP309 0.0-0.25M	TP309 0.25-0.5M	TP309 0.5-0.75M	TP309 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11704	B15-JI11705	B15-JI11706	B15-JI11707
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.1	4.6	5.3	4.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.6	2.1	2.9	3.4
Reaction Ratings* ^{S05}		comment	3.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	4.4	-	4.5	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	120	-	62	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.19	-	0.10	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	0.008	-	< 0.005	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	5.0	-	< 3	-
Sulfur - KCl Extractable	0.02	% S	< 0.02	-	< 0.02	-
HCl Extractable Sulfur	0.02	% S	< 0.02	-	< 0.02	-

Client Sample ID			TP309 0.0-0.25M	TP309 0.25-0.5M	TP309 0.5-0.75M	TP309 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11704	B15-JI11705	B15-JI11706	B15-JI11707
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Chromium Suite						
Net Acid soluble sulfur	0.02	% S	< 0.02	-	< 0.02	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	< 10	-	< 10	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	< 0.02	-	< 0.02	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	-	n/a	-
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	n/a	-	n/a	-
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	n/a	-	n/a	-
ANC Fineness Factor		factor	1.5	-	1.5	-
Net Acidity (Sulfur Units)	0.02	% S	0.19	-	0.10	-
Net Acidity (Acidity Units)	10	mol H+/t	120	-	62	-
Liming Rate ^{S01}	1	kg CaCO3/t	9.0	-	5.0	-
Extraneous Material						
<2mm Fraction	0.005	g	n/a	-	n/a	-
>2mm Fraction	0.005	g	n/a	-	n/a	-
Analysed Material	0.1	%	100	-	100	-
Extraneous Material	0.1	%	< 0.1	-	< 0.1	-
% Moisture	0.1	%	23	-	16	-

Client Sample ID			TP309 1.0-1.25M	TP309 1.25-1.5M	TP309 1.5-1.75M	TP309 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11708	B15-JI11709	B15-JI11710	B15-JI11711
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.6	4.3	4.0	4.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.5	3.0	3.7	4.4
Reaction Ratings ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	-	-	4.7
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	35
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	-	-	0.06
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	-	-	-	< 0.02
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	-	-	n/a
Acid Neutralising Capacity - acidity (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
Net Acidity (Sulfur Units)	0.02	% S	-	-	-	0.06
Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	35
Liming Rate ^{S01}	1	kg CaCO3/t	-	-	-	3.0

Client Sample ID			TP309 1.0-1.25M	TP309 1.25-1.5M	TP309 1.5-1.75M	TP309 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11708	B15-JI11709	B15-JI11710	B15-JI11711
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Extraneous Material						
<2mm Fraction	0.005	g	-	-	-	n/a
>2mm Fraction	0.005	g	-	-	-	n/a
Analysed Material	0.1	%	-	-	-	100
Extraneous Material	0.1	%	-	-	-	< 0.1
% Moisture						
	0.1	%	-	-	-	13

Client Sample ID			TP312 0.0-0.25M	TP312 0.25-0.5M	TP312 0.5-0.75M	TP312 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI11712	B15-JI11713	B15-JI11714	B15-JI11715
Date Sampled			Jul 09, 2015	Jul 09, 2015	Jul 09, 2015	Jul 09, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	3.8	3.7	4.8	3.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.3	2.4	2.7	2.1
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	4.1	-	4.9
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	210	-	34
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	0.33	-	0.05
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	< 0.005	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	< 3	-	< 3
Sulfur - KCl Extractable	0.02	% S	-	0.04	-	< 0.02
HCl Extractable Sulfur	0.02	% S	-	0.06	-	n/a
Net Acid soluble sulfur	0.02	% S	-	< 0.02	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	< 10	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	< 0.02	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	n/a	-	n/a
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	-	n/a	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	-	n/a	-	n/a
ANC Fineness Factor		factor	-	1.5	-	1.5
Net Acidity (Sulfur Units)	0.02	% S	-	0.34	-	0.05
Net Acidity (Acidity Units)	10	mol H+/t	-	210	-	34
Liming Rate ^{S01}	1	kg CaCO3/t	-	16	-	3.0
Extraneous Material						
<2mm Fraction	0.005	g	-	n/a	-	n/a
>2mm Fraction	0.005	g	-	n/a	-	n/a
Analysed Material	0.1	%	-	100	-	100
Extraneous Material	0.1	%	-	< 0.1	-	< 0.1
% Moisture						
	0.1	%	-	26	-	16

Client Sample ID			TP333 1.0-1.25M	TP333 1.25-1.5M	TP333 1.5-1.75M	TP333 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI08389	B15-JI08390	B15-JI08391	B15-JI08392
Date Sampled			Jul 07, 2015	Jul 07, 2015	Jul 07, 2015	Jul 07, 2015
Test/Reference	LOR	Unit				
Extraneous Material						
<2mm Fraction	0.005	g	n/a	-	-	-
>2mm Fraction	0.005	g	n/a	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture						
	0.1	%	29	-	-	-

Client Sample ID			TP334 0.0-0.25M	TP334 0.25-0.5M	TP334 0.5-0.75M	TP334 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI08393	B15-JI08394	B15-JI08395	B15-JI08396
Date Sampled			Jul 07, 2015	Jul 07, 2015	Jul 07, 2015	Jul 07, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.9	4.7	4.5	4.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.2	3.3	3.1	2.8
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	4.2	-	4.3
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	100	-	99
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	0.16	-	0.16
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	< 0.005	-	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	< 3	-	< 3
Sulfur - KCl Extractable	0.02	% S	-	0.02	-	0.04
HCl Extractable Sulfur	0.02	% S	-	0.03	-	0.04
Net Acid soluble sulfur	0.02	% S	-	< 0.02	-	< 0.02
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	< 10	-	< 10
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	< 0.02	-	< 0.02
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	n/a	-	n/a
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	-	n/a	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	-	n/a	-	n/a
ANC Fineness Factor		factor	-	1.5	-	1.5
Net Acidity (Sulfur Units)	0.02	% S	-	0.17	-	0.16
Net Acidity (Acidity Units)	10	mol H+/t	-	100	-	99
Liming Rate ^{S01}	1	kg CaCO3/t	-	8.0	-	7.0
Extraneous Material						
<2mm Fraction	0.005	g	-	n/a	-	n/a
>2mm Fraction	0.005	g	-	n/a	-	n/a
Analysed Material	0.1	%	-	100	-	100
Extraneous Material	0.1	%	-	< 0.1	-	< 0.1
% Moisture						
	0.1	%	-	26	-	18

Client Sample ID			TP334 1.0-1.25M	TP334 1.25-1.5M	TP334 1.5-1.75M	TP334 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI08397	B15-JI08398	B15-JI08399	B15-JI08400
Date Sampled			Jul 07, 2015	Jul 07, 2015	Jul 07, 2015	Jul 07, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.4	5.1	5.2	5.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.8	3.2	3.0	3.3
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	5.4	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	9.0	-	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	< 0.02	-	-
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	-	< 0.02	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	n/a	-	-
Acid Neutralising Capacity - acidity (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	-	-
Net Acidity (Sulfur Units)	0.02	% S	-	< 0.02	-	-
Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	-	-
Liming Rate ^{S01}	1	kg CaCO3/t	-	1.0	-	-
Extraneous Material						
<2mm Fraction	0.005	g	-	n/a	-	-
>2mm Fraction	0.005	g	-	n/a	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture						
	0.1	%	-	27	-	-

Client Sample ID			TP335 0.0-0.25M	TP335 0.25-0.5M	TP335 0.5-0.75M	TP335 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI08401	B15-JI08402	B15-JI08403	B15-JI08404
Date Sampled			Jul 07, 2015	Jul 07, 2015	Jul 07, 2015	Jul 07, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.7	4.0	4.2	4.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	1.9	2.7	2.9	2.9
Reaction Ratings* ^{S05}		comment	3.0	1.0	1.0	1.0

Client Sample ID			TP335 1.0-1.25M	TP335 1.25-1.5M	TP335 1.5-1.75M	TP335 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI08405	B15-JI08406	B15-JI08407	B15-JI08408
Date Sampled			Jul 07, 2015	Jul 07, 2015	Jul 07, 2015	Jul 07, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.2	4.6	4.9	4.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.9	3.0	2.8	2.5
Reaction Ratings* ^{S05}		comment	1.0	1.0	1.0	1.0

Client Sample ID			TP336 0.0-0.25M	TP336 0.25-0.5M	TP336 0.5-0.75M	TP336 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI08409	B15-JI08410	B15-JI08411	B15-JI08412
Date Sampled			Jul 07, 2015	Jul 07, 2015	Jul 07, 2015	Jul 07, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.4	4.2	4.0	4.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.3	2.8	2.6	2.7
Reaction Ratings* ^{S05}		comment	3.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	4.2	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	170	-	-	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.28	-	-	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	0.068	-	-	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	42	-	-	-
Sulfur - KCl Extractable	0.02	% S	0.02	-	-	-
HCl Extractable Sulfur	0.02	% S	0.03	-	-	-
Net Acid soluble sulfur	0.02	% S	< 0.02	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	< 10	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	< 0.02	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	-	-	-
Acid Neutralising Capacity - acidity (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	-	-	-
Net Acidity (Sulfur Units)	0.02	% S	0.36	-	-	-
Net Acidity (Acidity Units)	10	mol H+/t	220	-	-	-
Liming Rate ^{S01}	1	kg CaCO3/t	17	-	-	-
Extraneous Material						
<2mm Fraction	0.005	g	n/a	-	-	-
>2mm Fraction	0.005	g	n/a	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture						
	0.1	%	33	-	-	-

Client Sample ID			TP336 1.0-1.25M	TP336 1.25-1.5M	TP336 1.5-1.75M	TP336 1.75-2.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI08413	B15-JI08414	B15-JI08415	B15-JI08416
Date Sampled			Jul 07, 2015	Jul 07, 2015	Jul 07, 2015	Jul 07, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.5	4.5	4.4	4.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.9	2.6	2.3	2.6
Reaction Ratings* ^{S05}		comment	1.0	1.0	2.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	4.6	-	4.4
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	26	-	48
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	0.04	-	0.08
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	< 0.005	-	0.007
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	< 3	-	4.0
Sulfur - KCl Extractable	0.02	% S	-	< 0.02	-	0.03
HCl Extractable Sulfur	0.02	% S	-	n/a	-	0.03
Net Acid soluble sulfur	0.02	% S	-	n/a	-	< 0.02
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	< 10
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	-	n/a	-	< 0.02
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	n/a	-	n/a
Acid Neutralising Capacity - acidity (ANCbt)	2	mol H+/t	-	n/a	-	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	-	n/a	-	n/a
ANC Fineness Factor		factor	-	1.5	-	1.5
Net Acidity (Sulfur Units)	0.02	% S	-	0.04	-	0.09
Net Acidity (Acidity Units)	10	mol H+/t	-	26	-	55
Liming Rate ^{S01}	1	kg CaCO3/t	-	2.0	-	4.0
Extraneous Material						
<2mm Fraction	0.005	g	-	n/a	-	n/a
>2mm Fraction	0.005	g	-	n/a	-	n/a
Analysed Material	0.1	%	-	100	-	100
Extraneous Material	0.1	%	-	< 0.1	-	< 0.1
% Moisture						
	0.1	%	-	29	-	34

Client Sample ID			TP337 0.0-0.25M	TP337 0.25-0.5M	TP337 0.5-0.75M	TP337 0.75-1.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			B15-JI08417	B15-JI08418	B15-JI08419	B15-JI08420
Date Sampled			Jul 07, 2015	Jul 07, 2015	Jul 07, 2015	Jul 07, 2015
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.5	4.2	4.1	4.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.2	2.8	2.9	2.7
Reaction Ratings* ^{S05}		comment	3.0	1.0	1.0	1.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	4.1	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	120	-	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	0.20	-	-
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	-	0.05	-	-
HCl Extractable Sulfur	0.02	% S	-	0.07	-	-

APPENDIX C

Limitations

LIMITATIONS

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APPENDIX 5 - EXAMPLE OF CORRECTIVE ACTION REPORT FORM

CORRECTIVE ACTION REPORT			
Report No.			
Prepared By:		Position:	
Date		Time:	
Details Of Non-Conformance:			
Date:		Time:	
Location:			
Inspected By:		Position:	
Description of Event:			
Likely Causes:			
Details of Corrective Action/s:			
Proposed Corrective Action/s:			
Dated Submitted to Developer:		Reply Required By:	
Dated Submitted to Regulator:		Reply Required By:	
Consultant/Expert/Regulator Advice (if required):			
Date Corrective Action Required By:			
Person Responsible for Corrective Action:			
Corrective Action Authorised By:		Date/Signed:	
Date Corrective Action/s Implemented:			
Corrective Action Follow-up Required/Completed:			

Land Based Environmental Management Plan
North East Business Park - Mixed Industry and Business Area Bulk Earthworks Application

Circulation:		Developer
		Department of Environment
		Moreton Bay Regional Council
		Other

APPENDIX 6 - FAUNA MANAGEMENT PLAN (JWA 2020)



FAUNA MANAGEMENT PLAN

North East Business Park Mixed Industry and Business Area Bulk Earthworks

Lot 1 on SP266287, Lot 2 on SP169551, Lot 11 on SP130251,
Lot 15 on RP902073 and Lot 2000 SP288124
2 and 15 Nolan Drive, Morayfield

A Report Prepared for
North Harbour Holdings Pty Ltd

AUGUST 2020

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Client Issue

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1 Introduction

1.1 Background

JWA Pty Ltd have been engaged by North East Business Park Pty Ltd to complete a Fauna Management Plan (FMP) for the proposed bulk earthworks associated with the Mixed Industry and Business Area (MIBA) within the North East Business Park (NEBP) development.

This FMP provides specific measures for mitigating and/or minimising the potential impacts on fauna as a result of development activities on the subject site.

1.2 The Subject Site

The site is located at Nolan Drive, Morayfield and is formally described as Lot 1 on SP266287, Lot 11 on SP130251, Lot 15 on RP902073, Lot 2000 on SP309348 and Lot 2 on SP169551 (FIGURE 1). The site is approximately 404.79 ha. An aerial photograph of the site is shown in FIGURE 2.

The property is currently used for cattle grazing, with vegetation dominated by a range of native and introduced pasture grasses. Prior to being used for grazing, the site was used for plantation forestry of *Pinus elliottii* (Slash pine). The Caboolture River forms the northern boundary where some mature vegetation is existing along the banks of the river. This vegetation has been planted by NEBP as part of the rehabilitation of the Caboolture River. Small isolated pockets of vegetation are scattered throughout the remainder of the site.

1.3 The Approved Development

The proposed development is for bulk earthworks associated with the MIBA area, works within Raff Creek necessary to remove the existing pipe culvert (and allow for the future extension of Moreton Bay Boulevard) and widen the creek to improve future flood conveyance, and the construction of stormwater treatment wetlands. The extent of bulk earthworks is shown in FIGURE 3.

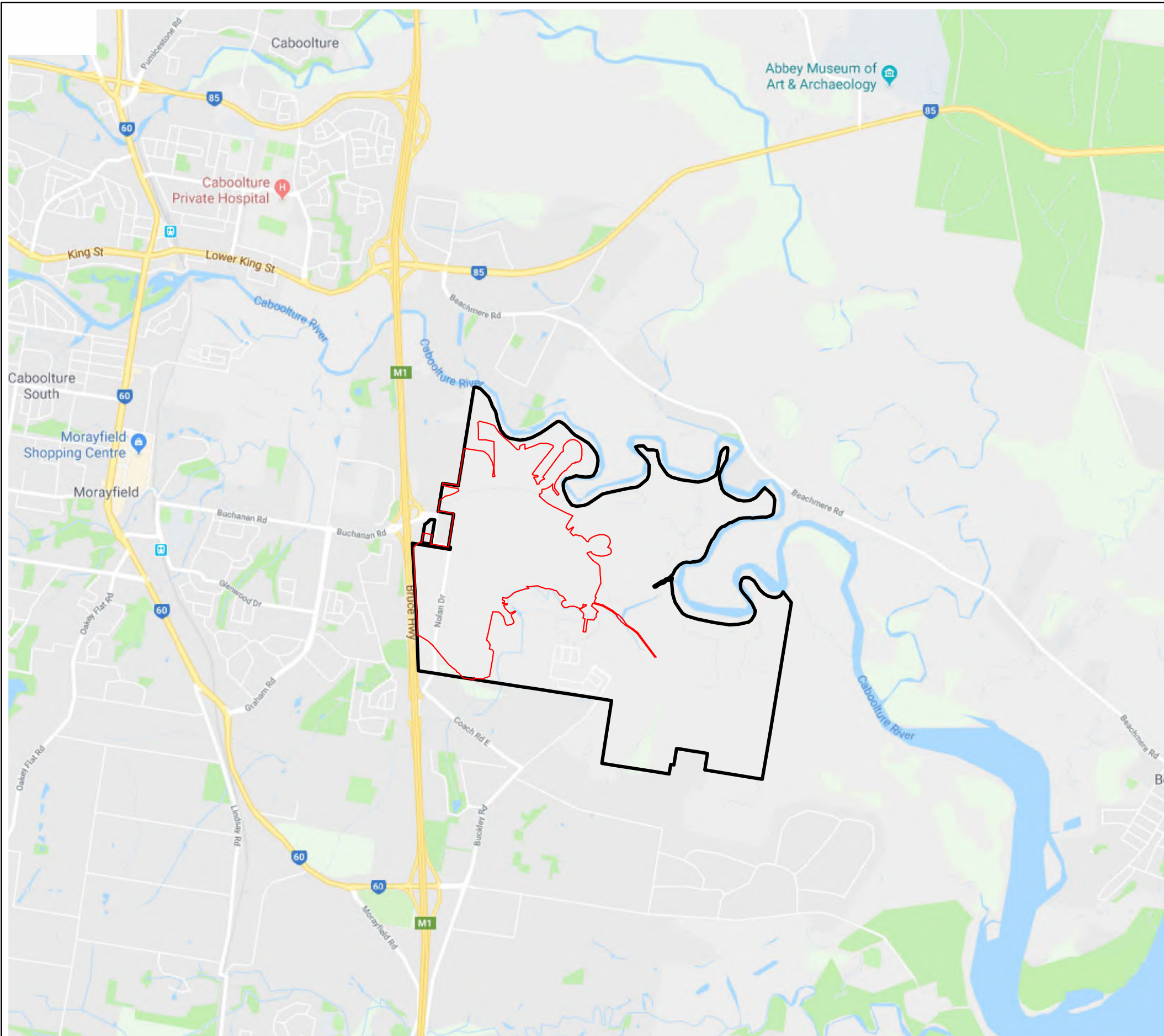
Although the entire works site will be cleared as part of the works program, the clearance of native vegetation is limited to the removal of a combined total of approximately 0.65 ha of intact non-remnant native vegetation. A Vegetation Clearance Plan illustrating various vegetation communities/habitat types to be cleared is provided in FIGURE 4.

1.4 Approval Conditions

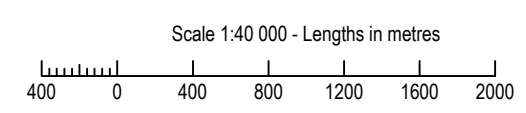
This FMP addresses Conditions 26, 27 and 29 of the approval conditions issued by Moreton Bay Regional Council on the 27th February 2020. These conditions are as follows:

26. Fauna Connectivity

Submit an amended Fauna Management Plan (currently Section 4 of the Vegetation Management Plan) which demonstrates:



LEGEND
 MIBA Bulk Earthworks Boundary
 NEBP Site Boundary



SOURCE: Google Maps SCALE: 1 : 40 000 @ A3	CLIENT North Harbour Holdings Pty Ltd PROJECT Fauna Management Plan NEBP MIBA Bulk Earthworks Nolan Drive, Morayfield QLD Moreton Bay Regional Council LGA	FIGURE 1 PREPARED: BW DATE: 03 August 2020 FILE: Q15003_MIBA VFMP_20200803.dwg	TITLE LOCALITY PLAN
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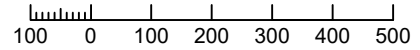
*JWA Pty Ltd
Ecological Consultants*



LEGEND

- MIBA Bulk Earthworks Boundary
- NEBP Site Boundary



Scale 1:12 500 - Lengths in metres


SOURCE: QLD Globe 2019 Aerial Photo

SCALE: 1 : 12 500 @ A3

JWA Pty Ltd
 Ecological Consultants

CLIENT
 North Harbour Holdings Pty Ltd
 PROJECT
 Fauna Management Plan
 NEBP MIBA Bulk Earthworks
 Nolan Drive, Morayfield QLD
 Moreton Bay Regional Council LGA

FIGURE 2

PREPARED: BW
 DATE: 03 August 2020
 FILE: Q15003_MIBA VFMP_20200803.dwg

TITLE

**AERIAL
 PHOTOGRAPH**



LEGEND

- MIBA Bulk Earthworks Boundary
- NEBP Site Boundary
- MIBA Bulk Earthworks - Extent of Works



Scale 1:12 500 - Lengths in metres
 100 0 100 200 300 400 500

SOURCE: KN Group (Ref: 18-203-MCU27 PHASING.dwg); QLD Globe 2019 Aerial Photo

SCALE: 1 : 12 500 @ A3

JWA Pty Ltd
 Ecological Consultants

CLIENT
 North Harbour Holdings Pty Ltd

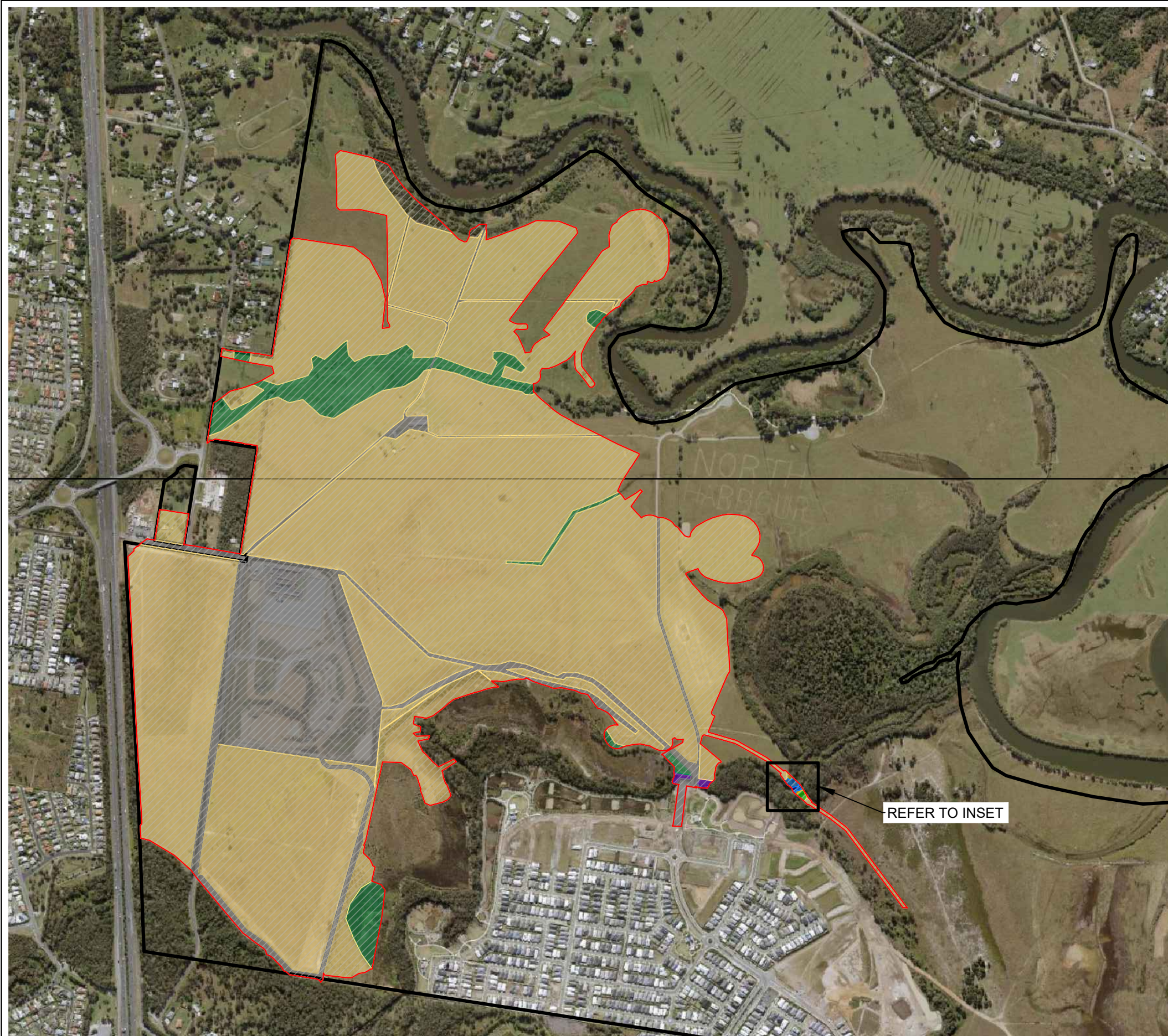
PROJECT
 Fauna Management Plan
 NEBP MIBA Bulk Earthworks
 Nolan Drive, Morayfield QLD
 Moreton Bay Regional Council LGA

FIGURE 3

PREPARED: BW
 DATE: 03 August 2020
 FILE: Q15003_MIBA VFMP_20200803.dwg

TITLE

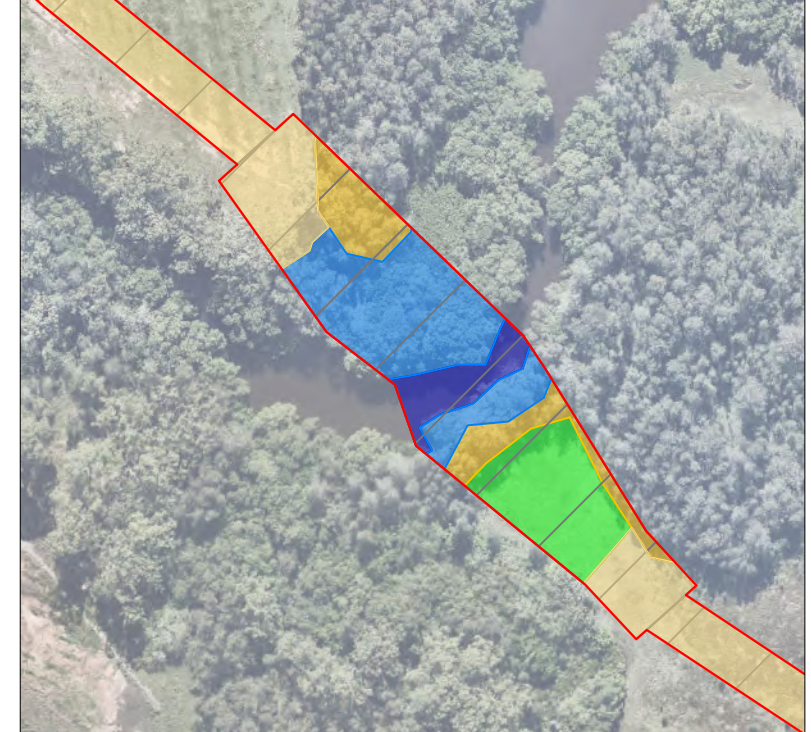
**MIBA
 BULK EARTHWORKS
 EXTENT**



LEGEND

- Extent of Works
- LBEMP Sub-plan 06 Site Boundary
- NEBP Site Boundary
- Vegetation Communities**
- Community 1: Disturbed wet-terrestrial grassland / sedgeland mosaic
- Community 2: Mangrove and casuarina estuarine wetlands
- Community 3: Salt couch grassland
- Community 4: Open Casuarina glauca forest
- Community 5: Mangrove shrubland to low closed forest
- Community 6: Revegetation area
- Community 7: Disturbed terrestrial grassland with scattered regrowth
- Existing roads, tracks and development
- Open Water

INSET - RAFF CREEK CROSSING DETAIL



Scale 1:12 500 - Lengths in metres

SOURCE: KN Group (Ref: 18-203-MCU27 PHASING.dwg); JWA Site Investigations; QLD Globe Aerial dated 30/05/19 -18/06/19
 SCALE: 1 : 12 500 @ A3

JWA Pty Ltd
 Ecological Consultants

CLIENT
 North Harbour Holdings Pty Ltd
 PROJECT
 Fauna Management Plan
 NEBP MIBA Bulk Earthworks
 Nolan Drive, Morayfield QLD
 Moreton Bay Regional Council LGA

FIGURE 4
 PREPARED: BW
 DATE: 10 August 2020
 FILE: Q15003_MIBA VFMP_20200803.dwg

TITLE
**VEGETATION
 CLEARANCE
 PLAN**

a) Works do not create a barrier to, and maintain or enhance ecological connectivity, including to, from and through, the following key areas:

- i) Along what is locally known as the Raff Creek Corridor.
- ii) Between Lot 2 SP169551 (Category B area) and adjoining Lots and road reserves.
- iii) Along the Caboolture River frontage for a width of 100m.
- iv) Between Lot 13 RP145197, Lot 2 RP194131 and the Caboolture River Tributary (which flows from the Southbound Bruce Highway Interchange at Buchanan Road through Lot 1 SP266287 and discharges into the Caboolture River).
- v) Along the Gympie Creek Tributary (which flows from Cobb Road through Lot 2000 SP30934 7 and discharges into what is locally known as Raff Creek).

27. No Net Loss of Fauna Habitat

Development does not result in the net loss of fauna habitat. Where development does result in the loss of a Habitat Tree, development will provide replacement fauna nesting boxes at the following rate:

- a) One (1) nest box for every hollow removed; or
- b) Where hollows have not yet formed in trees greater than 80cm in diameter at 1.3m height, three (3) nest boxes are required for every habitat tree removed.

29. Management of Wildlife

A. Tag all trees to be removed and inspect for any signs of wildlife. Carry out approved vegetation clearing under the supervision of a Fauna Spotter Catcher holding a valid Rehabilitation permit from the relevant State Government Agency.

B. The clearing of vegetation on premises must be carried out in a way that ensures:

- a) wildlife have enough time to move from the area being cleared without human intervention; and
- b) links between wildlife habitats are maintained to allow wildlife to move from the area being cleared; and
- c) a tree is not cleared if wildlife is present in the tree or the crown of the tree overlaps another tree in which wildlife is present.

C. The clearing of koala habitat trees must be carried out in a way that complies with the sequential clearing conditions for Koala District A, as outlined in part 3 of the Nature Conservation (Koala) Conservation Plan 2017 and requirements for native vegetation clearing as outlined in Part 2, S8(2) of Schedule 11 of the Planning Regulation 2017, including:

- a) ensuring not more than the following is cleared in any 1 stage:
 - i) for a clearing site with an area of 6ha or less - 50% of the site's area;

ii) for a clearing site with an area of more than 6ha - 3ha or 3% of the site's area, whichever is the greater; and

iii) ensuring that between each stage and the next there is at least 1 period of 12 hours starting at 6pm on a day and ending at 6am on the following day during which no trees are cleared on the site;

b) ensuring clearing of koala habitat trees having a trunk of a diameter of more than 10cm at 1.3m above the ground is carried out in the presence of a koala spotter.

D. Provide an activity report, to be completed by the supervising Fauna Spotter Catcher, including:

- a) The number and species of any animals observed during clearing;*
- b) The actions taken to deal with observed animals;*
- c) The number of any animals that were required to be relocated;*
- d) The release site for any relocated animals;*
- e) The number (if any) of animals injured during clearing;*
- f) The treatment provided;*
- g) The outcome of any treatment; and*
- h) The location of the treatment.*

2 Fauna Assessment

2.1 Introduction

The following section provides an assessment of the existing habitat values of the subject site and has been compiled from previous desktop assessments and site assessments of the subject site and adjacent sites undertaken by JWA, Cardno, and Yurrah between 2004 and 2020.

2.2 Desktop Assessment

Database searches using the Commonwealth Protected Matters Search Tool (PMST) identified thirty-two (32) threatened fauna species that may occur within 5km of the subject site based on the availability of suitable habitats. The Queensland Department of Environment and Science (DES) Wildlife Online database indicated that fifteen (15) threatened fauna species have been recorded from within 5km of the subject site.

Threatened fauna species detected in the database searches are listed in **TABLE 1**. The conservation status of each species listed in **TABLE 1** is shown in accordance with the Commonwealth *Environment Protection and Biodiversity Conservation Act (1999)* and the Queensland *Nature Conservation (Wildlife) Regulation (2006)*.

Database searches using the Commonwealth PMST also revealed that fifty-five (55) migratory or marine species may occur within 5km of the site based on the availability of suitable habitat. Migratory species identified in database searches are listed in **TABLE 2**.

It should be noted that species that will clearly not occur on the site (e.g. cetaceans, marine reptiles and oceanic birds) have been omitted.

TABLE 1
DATABASE RECORDS OF LISTED THREATENED FAUNA SPECIES
WITHIN 5KM OF THE SITE

Scientific Name	Common Name	EPBC#	NCWR*
<i>Anthochaera phrygia</i>	Regent honeyeater	CE	QE
<i>Argynnis hyperbius inconstans</i>	Australian fritillary	CCE	QE
<i>Botaurus poiciloptilus</i>	Australian bittern	CE	QE
<i>Calidris canutus</i>	Red knot	CE	(QE)
<i>Calidris ferruginea</i>	Curlew sandpiper	CCE	(QE)
<i>Calidris tenuirostris</i>	Great knot	CCE	(QE)
<i>Calyptorhynchus lathamii</i>	Glossy black cockatoo (eastern)	(-)	QV
<i>Charadrius leschenaultii</i>	Greater sand plover	CV	(QV)
<i>Charadrius mongolus</i>	Lesser sand plover	CE	QE
<i>Chalinolobus dwyeri</i>	Large-eared pied bat	CV	(QV)
<i>Crinia tinnula</i>	Wallum froglet	(-)	QV
<i>Dasyurus hallucatus</i>	Northern quoll	CE	(-)
<i>Dasyurus maculatus maculatus</i>	Spot-tailed quoll	CE	(QV)

Scientific Name	Common Name	EPBC#	NCWR*
<i>Delma torquata</i>	Collared delma	CV	(QV)
<i>Epinephelus daemeli</i>	Black rockcod	CV	(-)
<i>Erythrotriorchis radiatus</i>	Red goshawk	CV	(QE)
<i>Furina dunmalli</i>	Dunmall's snake	CV	(QV)
<i>Grantiella picta</i>	Painted honeyeater	(CV)	QV
<i>Hirundapus caudacutus</i>	White-throated needletail	CV	QV
<i>Lathamus discolor</i>	Swift parrot	CE	(QE)
<i>Limosa lapponica baueri</i>	Bar-tailed godwit	CV	(QV)
<i>Limosa lapponica menzbieri</i>	Northern Siberian bar-tailed godwit	CCE	(QE)
<i>Litoria olongburensis</i>	Wallum sedge frog	CV	QV
<i>Mixophyes fleayi</i>	Fleay's frog	CE	(QE)
<i>Mixophyes iteratus</i>	Giant barred frog	CE	QE
<i>Neoceratodus forsteri</i>	Australian lungfish	(CV)	-
<i>Numenius madagascariensis</i>	Eastern curlew	CCE	QE
<i>Petauroides volans</i>	Greater glider	CV	QV
<i>Phascolarctos cinereus</i>	Koala	CV	QV
<i>Potorous tridactylus tridactylus</i>	Long-nosed potoroo	CV	(QV)
<i>Pteropus poliocephalus</i>	Grey-headed flying-fox	CV	-
<i>Rostratula australis</i>	Australian painted snipe	CE	QE
<i>Saiphos reticulatus</i>	Three-toed snake-tooth skink	CV	(-)
<i>Tenuibranchiurus glypticus</i>	Swamp crayfish	-	QE
<i>Thinornis rubricollis rubricollis</i>	Hooded plover (eastern)	CV	(-)
<i>Turnix melanogaster</i>	Black-breasted button-quail	CV	(QV)
<i>Xeromys myoides</i>	Water mouse	CV	(QV)

CCE - Critically Endangered, CE - Endangered and CV - Vulnerable as listed within schedules of the Commonwealth EPBC Act (1999);
* QE - Endangered, QV - Vulnerable and QNT - Near Threatened as listed within schedules of the Queensland NCWR (2006);
() listed but not found in site database search.

TABLE 2
DATABASE RECORDS OF COMMONWEALTH LISTED MIGRATORY AND MARINE SPECIES
WITHIN 5KM OF THE SITE

Scientific Name	Common Name	Status#
<i>Actitis hypoleucos</i>	Common sandpiper	M, Ma
<i>Anous stolidus</i>	Common noddy	M, Ma
<i>Anseranas semipalmata</i>	Magpie goose	Ma
<i>Apus pacificus</i>	Fork-tailed swift	M, Ma
<i>Ardea alba</i>	Great egret	Ma
<i>Ardea ibis</i>	Cattle egret	Ma
<i>Arenaria interpres</i>	Ruddy turnstone	M, Ma
<i>Calidris acuminata</i>	Sharp-tailed sandpiper	M, Ma
<i>Calidris alba</i>	Sanderling	M, Ma

Scientific Name	Common Name	Status#
<i>Calidris canutus</i>	Red knot	M, Ma, CE, QE
<i>Calidris ferruginea</i>	Curlew sandpiper	M, Ma, CCE, QE
<i>Calidris melanotos</i>	Pectoral sandpiper	M, Ma
<i>Calidris ruficollis</i>	Red-necked stint	M, Ma
<i>Calidris tenuirostris</i>	Great knot	M, Ma, CCE, QE
<i>Charadrius bicinctus</i>	Double-banded plover	M, Ma
<i>Charadrius leschenaultii</i>	Great sand plover	M, Ma, CV, QV
<i>Charadrius mongolus</i>	Lesser sand plover	M, Ma, CE, QE
<i>Charadrius ruficapillus</i>	Red-capped plover	Ma
<i>Charadrius veredus</i>	Oriental plover	M, Ma
<i>Cuculus optatus</i>	Oriental cuckoo	M
<i>Cuculus saturates</i>	Himalayan cuckoo	Ma
<i>Gallinago hardwickii</i>	Latham's snipe	M, Ma
<i>Gallinago megala</i>	Swinhoe's snipe	M, Ma
<i>Gallinago stenura</i>	Pin-tailed snipe	M, Ma
<i>Haliaeetus leucogaster</i>	White-bellied sea-eagle	Ma
<i>Heteroscelus brevipes</i>	Grey-tailed tattler	Ma
<i>Heteroscelus incanus</i>	Wandering tattler	Ma
<i>Himantopus himantopus</i>	Black-winged stilt	Ma
<i>Hirundapus caudacutus</i>	White-throated needletail	M, Ma, CV, QV
<i>Lathamus discolor</i>	Swift parrot	Ma, CCE, QE
<i>Limicola falcinellus</i>	Broad-billed sandpiper	M, Ma
<i>Limnodromus semipalmatus</i>	Asian dowitcher	M, Ma
<i>Limosa lapponica</i>	Bar-tailed godwit	M, Ma, CE/V, QE/V
<i>Limosa limosa</i>	Black-tailed godwit	M, Ma
<i>Merops ornatus</i>	Rainbow bee-eater	Ma
<i>Monarcha melanopsis</i>	Black-faced monarch	Ma
<i>Monarcha trivirgatus</i>	Spectacled monarch	Ma
<i>Myiagra cyanoleuca</i>	Satin flycatcher	Ma
<i>Numenius madagascariensis</i>	Eastern curlew	M, CCE, QE
<i>Numenius minutus</i>	Little curlew	M, Ma
<i>Numenius phaeopus</i>	Whimbrel	M, Ma
<i>Pandion haliaetus</i>	Osprey	M, Ma
<i>Philomachus pugnax</i>	Ruff	M, Ma
<i>Pluvialis fulva</i>	Pacific golden plover	M, Ma
<i>Pluvialis squatarola</i>	Grey plover	M, Ma
<i>Recurvirostra novaehollandiae</i>	Red-necked avocet	Ma
<i>Rhipidura rufifrons</i>	Rufous fantail	M, Ma
<i>Rostratula benghalensis (sensu lato)</i>	Painted snipe	Ma, CE
<i>Sternula albifrons</i>	Little tern	M, Ma
<i>Tringa brevipes</i>	Grey-tailed tattler	M
<i>Tringa glareola</i>	Wood sandpiper	M, Ma
<i>Tringa incana</i>	Wandering tattler	M

Scientific Name	Common Name	Status#
<i>Tringa nebularia</i>	Common greenshank	M, Ma
<i>Tringa stagnatilis</i>	Marsh sandpiper	M, Ma
<i>Xenus cinereus</i>	Terek sandpiper	M, Ma
# CCE - Critically Endangered, CE - Endangered, CV - Vulnerable, M - Migratory, Ma - Marine as listed within schedules of the Commonwealth EPBCA (1999); QE - Endangered, QV - Vulnerable as listed within the schedules of the Queensland Nature Conservation (Wildlife) Regulation 2006.		

2.3 Vegetation Communities

Six (6) distinct vegetation types occur on the subject site (**FIGURE 4**):

- Community 1 - Disturbed wet-terrestrial grassland / sedgeland mosaic
- Community 2 - Mangrove and casuarina estuarine wetlands
- Community 3 - Salt couch grassland
- Community 4 - Open *Casuarina glauca* forest
- Community 5 - Mangrove shrubland to low closed forest
- Community 6 - Disturbed terrestrial grassland with scattered regrowth

2.4 Habitat Assessment

2.4.1 Introduction

Site habitats were assessed to determine their value for native fauna species. The assessment focused on identifying habitat features associated with Threatened species as well as other native fauna groups. Particular attention was paid to habitat features such as:

- The presence of mature trees with hollows, fissures and/or other suitable roosting/nesting places.
- The presence of Koala food trees.
- The presence of preferred Glossy black cockatoo feed trees (Forest oak and/or Black she-oak).
- The presence of Yellow-bellied glider feeding scars.
- Condition, flow and water quality of drainage lines and bodies of water.
- Areas of dense vegetation.
- Presence of hollow logs/debris and areas of dense leaf litter.
- Presence of fruiting flora species.
- Presence of blossoming flora species, particularly winter-flowering species.
- Vegetation connectivity and proximity to neighbouring areas of intact vegetation.
- Presence of caves and man-made structures suitable as microchiropteran bat roost sites.

The following sections discuss the habitat requirements of the broad fauna groups and the availability of suitable habitat on site.

2.4.2 Amphibians

Amphibians occurring in the region are poikilothermic, predominantly insectivorous and generally require free water for reproduction, with the exception of two highland genera (*Assa darlingtoni* and *Philoria* spp.) The habitat requirements of most species are unlikely to be determined by forest cover or floristics, but are more strongly influenced by factors such as climate, distance to water bodies, riparian vegetation, hydrological and morphological characteristics of water bodies and the availability of suitable micro-habitat for aestivation and shelter.

The majority of species that occur within the region lay eggs in or near temporary or permanent water bodies and rely on free water for larval development and metamorphosis. Of these species, only a few are dependent on forested habitats beyond the riparian zone or beyond areas of temporary inundation. These species include the Red-eyed tree frog (*Litoria chloris*), Leseuer's frog (*Litoria leseueri*), Fletchers frog (*Lechriodus fletcheri*) and the Barred frogs of the *Mixophyes* genus.

The minor drainage lines that traverse the site is likely to provide habitat for commonly occurring amphibian species such as the Green tree frog (*Litoria caerulea*), Eastern dwarf tree frog (*Litoria fallax*) and Common eastern froglet (*Crinia signifera*). Grasslands provide suitable habitat for a range of Amphibian species, particularly along drainage depressions and soaks. Species commonly encountered in grassland communities include the Common eastern froglet, Eastern sign bearing froglet (*Crinia parinsignifera*), Striped marsh frog (*Limnodynastes peronii*), Spotted grass frog (*Limnodynastes tasmaniensis*), Eastern dwarf tree frog, Rocket frog (*Litoria nasuta*), Whistling tree frog (*Litoria verreauxii*) and Cane toad* (*Bufo marinus*). Sedgeland communities in low lying grassland areas may provide suitable habitat for these species.

It should be noted that Raff Creek is subject to tidal influences as evidenced by the presence of mangroves. It's value as frog habitat is therefore limited.

The Threatened Acid frog species (Wallum froglet (*Crinia tinnula*) has previously been recorded in the vicinity of the haul road. However, habitat in this area is considered to be marginal.

Species which typically occur in low elevation rainforest and permanent streams such as the Giant barred frog (*Mixophyes iteratus*) are unlikely to occur at the subject site.

2.4.3 Reptiles

As reptiles are poikilothermic, and predominantly insectivorous or carnivorous, their habitat requirements are less directly determined by vegetation species composition than other taxa which feed directly on plants. Reptile distributions are strongly influenced by structural characteristics of the vegetation, climate and other factors affecting

thermoregulation such as shade and availability of shelter and basking sites (Smith *et al* 1994).

In a survey of the moist forest herpetofauna of North-eastern NSW, Smith *et al* (1989) found that few species discriminated between rainforest and wet sclerophyll forest, however, most species exhibited a response to differences in elevation and the availability of microhabitat components and other substrates.

The availability of microhabitats, of varying thermal properties is particularly important for most reptile species, as behavioural thermoregulation (regulation of body heat) is important in controlling critical body functions such as digestion, foraging activity and reproduction.

Reptile diversity and abundance is often (but not always) significantly higher in drier habitat types, particularly those with a wide variety of ground substrate microhabitats. This contrasts markedly with the distribution patterns of birds, and most mammals.

The single limiting factor in terms of species diversity in coastal vegetation is the lack of shelter sites (e.g. logs, tree hollows and decorticating bark). Such habitat components characterise eucalypt forests and woodlands, where species diversity may be much higher, depending on disturbance factors.

The subject site is considered to provide low-moderate quality habitat for reptiles due to the presence of the combination of shelter and basking sites, fallen logs for shelter, forested areas with good canopy and leaf litter development in the vicinity of Raff Creek, and reliable sources of prey.

The subject site is likely to represent suitable habitat for commonly occurring reptile species such as Common garden skink (*Lampropholis delicata*), Friendly sun skink (*Lampropholis amicula*) and Carpet python (*Morelia spilota*).

Adjacent residential and commercial use may have resulted in a proliferation of introduced small mammals such as the House mouse (*Mus musculus*) and Black rat (*Rattus rattus*) which in turn provide prey for snakes such as the Red-bellied black snake (*Pseudechis porphyriacus*), Carpet python, Swamp snake (*Hemiaspis signata*) and Eastern brown snake (*Pseudonaja textilis*).

2.4.4 Birds

The significance of near coastal environments of the NSW Far North Coast and South-East Queensland as over-wintering habitat for migratory birds has been established by many observers and bird banders including Keast (1968), Robertson (1973), Gravatt (1974), Porter (1982) and Robertson and Woodall (1983). These patterns may be attributable to the relatively high winter temperatures and long growing season of this region compared with the rest of south-eastern Australia (Fitzpatrick and Nix 1973; Edwards 1979; Nix 1982; Specht *et al* 1981).

Many insectivorous birds from higher latitudes and elevation over-winter in the locality. These include species such as the Fantail cuckoo, Sacred kingfisher, Rainbow bee-eater, Noisy pitta, Tree martin, Black-faced cuckoo-shrike, Cicada bird, Golden whistler, Rufous whistler, Rose robin, Grey fantail, White-throated gerygone, Silvereye, Olive-backed oriole and Spangled drongo.

Birds such as honeyeaters and lorikeets are Blossom nomads (*ibid.*). These birds move locally in response to variation in the availability of nectar and or pollen, important components in their diet. Porter (1982) highlights the importance of Forest red gum, Broad-leaved paperbark and Coast banksia for Scaly-breasted and Rainbow lorikeets as these species flower during the lorikeet's winter breeding period. A sequence of important nectar bearing plants in the genera Eucalyptus, Banksia, Melaleuca and Callistemon provide a continuity of food for nectivorous birds.

Studies of bird usage in rainforest remnants by Holmes (1987), Connelly and Specht (1988) and Lott & Duigan (1993) indicate that the diversity and abundance of birds is related to the size of the Rainforest patches and their degree of isolation from major areas of native forest. Lott & Duigan (1993) and Howe *et al* (1981) also note that sites with a higher diversity of vegetation and those which are closer to water generally support a greater diversity of birds. Locally nomadic and migratory rainforest species such as the Wompoo, Rose-crowned and Superb fruit-doves, Common koel and Black-faced cuckoo-shrike are known to use scattered areas of habitat as "stepping-stones" between more intact areas of forest (Date *et al* 1992; Lott & Duigan 1993).

The habitats present on and adjacent to the subject site is likely to result in a moderate diversity of resident and nomadic birds occurring on the site over the year. Habitat which occur on or adjacent to the site include sedgeland, grasslands, and tidal communities such as mangrove/casuarina forest and saltmarsh.

The subject site provides suitable habitat for a range of disturbance adapted open country birds such as the Magpie (*Gymnorhina tibicen*), Lewin's honeyeater (*Meliphaga lewinii*), Torresian crow (*Corvus orru*), Magpie-lark (*Grallina cyanoleuca*) and Noisy miner (*Manorina melanocephala*).

Waterways and drainage lines on and adjacent to the subject site are likely to generate a substantial food source for insectivorous birds such as the Willie wagtail (*Rhipidura leucophrys*), Grey fantail (*Rhipidura fuliginosa*), Spangled drongo (*Dicrurus bracteatus*), Welcome swallow (*Hirundo neoxena*) etc.

As previously discussed, residential and commercial use of adjacent land may have resulted in a proliferation of introduced small mammals. These small mammals, as well as reptile species on the site, are likely to provide a food resource for various species of diurnal raptors, such as the Black-shouldered kite (*Elanus axillaris*), Brown falcon (*Falco berigora*) and Whistling kite (*Haliastur sphenurus*), as well as for nocturnal raptors such as the Barn owl (*Tyto alba*).

Trees with hollows necessary for hollow-nesting birds are generally not present.

2.4.5 Mammals

Small terrestrial mammals generally occur in highest densities in association with a complex vegetation structure. A dense understorey layer, which provides shelter from predators and provides nesting opportunities, is particularly important. As previously discussed, residential and commercial use of adjacent land may have been likely to result in a proliferation of introduced small mammals.

In general, medium-large terrestrial mammals such as macropods select habitats which provide a dense cover for shelter and refuge and open areas for feeding. The larger species tend to occupy drier more open habitats: the smaller species, moister and more densely vegetated habitats.

All arboreal mammals that occur in the region (with the exception of the Koala) utilise tree hollows for nesting and shelter (although the Common ringtail possum is not dependent on hollows). Smith and Lindenmeyer (1988) consider that shortage of nest hollows is likely to limit arboreal mammal populations where density of hollow bearing trees is less than 2 to 8 trees per hectare.

Trees with hollows necessary for hollow-dependent mammals are generally not present.

Arboreal folivores (e.g. Common ringtail possum, Greater glider) are widespread and abundant but exhibit local variation in response to such factors as tree species composition, foliage protein and fibre levels, leaf toughness, toxins, forest structure and the availability of shelter sites. Arboreal folivores are expected to be most abundant in areas of high productivity, high soil fertility and moderate climate, in conjunction with adequate shelter and suitable foraging substrate.

Arboreal nectarivore/insectivores feed on a wide variety of plant and insect exudates including the nectar of flowering eucalypts, and shrubs such as Banksia and Acacia sp. These species also feed extensively on insects, particularly under the shedding bark of eucalypts. The distribution of nectarivore/insectivores is considered to be related to the abundance of nectar and pollen producing plants, the abundance of bark shedding eucalypts which harbour insect prey, and the occurrence of sap and gum exudate producing trees (Sap feed trees) and shrubs (e.g. Acacia sp.). Arboreal nectarivores and insectivores are generally hollow dependent species.

The structural complexity and habitat diversity of the subject site is likely to support a low-moderate diversity and abundance of ground dwelling mammals. Expected species include Black rat, Swamp rat, House mouse, *Antechinus* sp., *Melomys* sp., and the Northern brown bandicoot.

Insectivorous bats, like insectivorous birds, overlap considerably in diet and broad vegetation preferences (Hall 1981), but specialise in foraging in specific layers or substrates within the forest (Crome and Richards 1988). Vegetation on and adjacent to the subject site is likely to provide forage habitat for a low-moderate diversity and abundance of insectivorous bats, due to the combination of open and forested areas of vegetation.

Suitable roost habitat for flying foxes are unlikely to occur on the subject site.

Potential habitat for the Water mouse (*Xeromys myoides*) occurs in mangrove communities on site.

2.5 Tree Hollows Within the Development Area

A targeted survey for potential habitat trees was completed over the site in July 2020. The locations of all potential habitat trees were recorded utilising a hand-held GPS unit. Potential habitat trees included trees containing one or more of the following features:

- Hollows, spouts and/or fissures with obvious depth;
- Bird nests or dreys; and
- Trees with nest boxes (installed during the Pacific Highway upgrade).

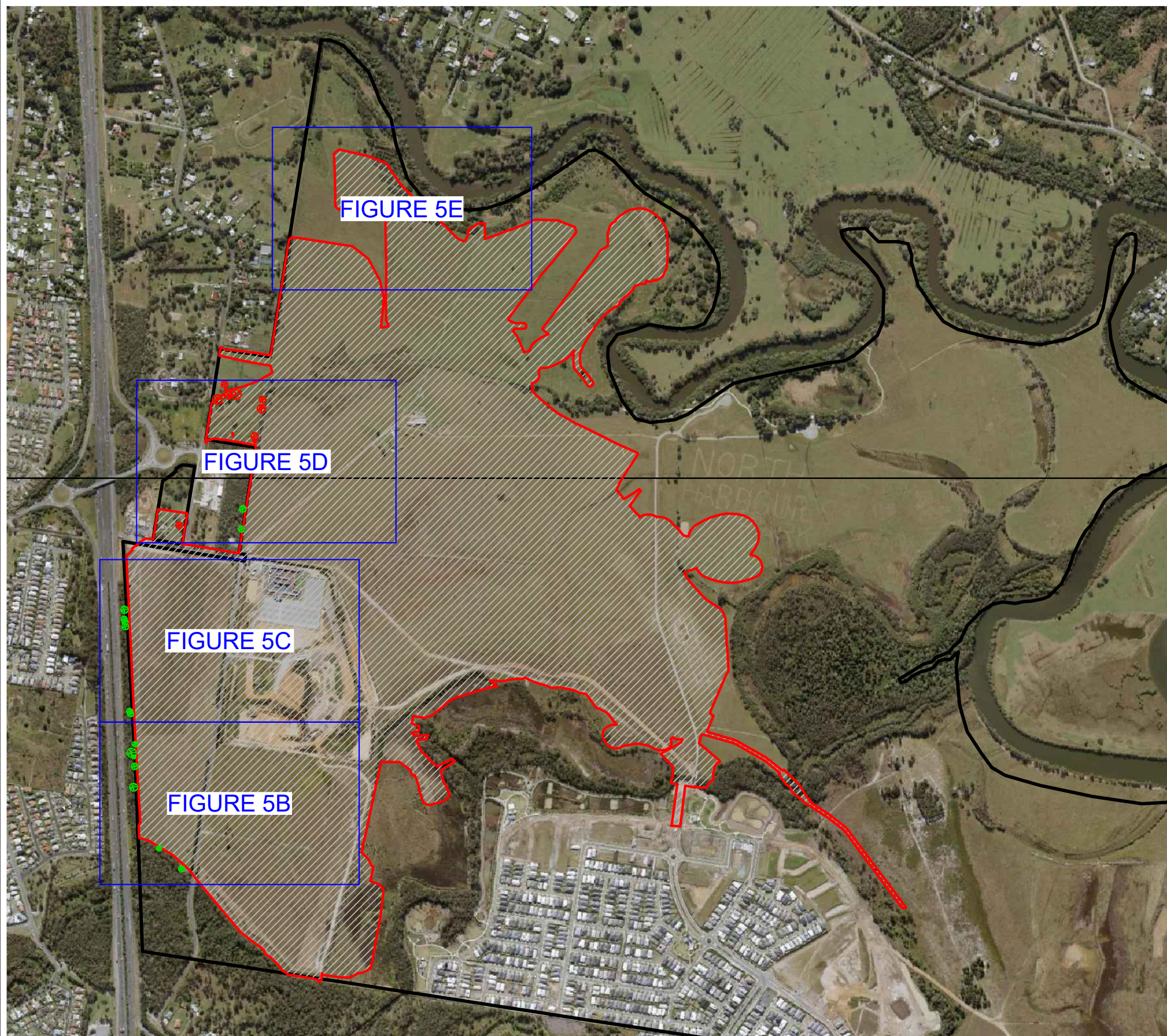
The type of all potential habitat features was recorded, and the results are provided in **APPENDIX 1**. In total, thirty-five (35) potential habitat trees were recorded from the subject site (**FIGURE 5**).

An overlay of the proposed development on the locations of habitat trees recorded from the site (**FIGURE 5**) has indicated that a number of potential habitat trees will be removed. Nest boxes will be installed in retained vegetation to compensate for the loss of these habitat features in accordance with Performance Outcome PO57 of the Moreton Bay Planning Scheme. Replacement fauna nesting boxes will be required at the rate of one (1) nest box for every hollow removed. Where hollows have not yet formed in trees with a diameter greater than 0.8m at 1.3m above the ground, three (3) nest boxes will be required for every habitat tree removed. The exact number and location of nest boxes to be installed will be detailed in a Fauna Spotter/Catcher Report (**SECTION 5.2**) to be approved prior to commencement of construction. Nest boxes will be designed for a range of locally occurring hollow dependant fauna species and constructed of materials with a minimum lifespan of 10 years. Nest boxes are to be located either within the rehabilitation area adjacent to Caboolture River or Raff Creek. Where nest boxes are proposed to be installed in revegetation areas, they will be mounted on treated hardwood timber poles.

2.6 Threatened Species Considered Possible Occurrences on the Subject Site

Based on the assessment of available habitat, threatened fauna species known from the locality were assessed for the likelihood of their occurrence on the Subject site (**APPENDIX 2**). Six (6) Threatened fauna species were known to occur or considered possible occurrences on the Subject site, including:

- Australian painted snipe (*Rostratula australis*);
- Grey-headed flying-fox (*Pteropus poliocephalus*) - **RECORDED**;



- LEGEND**
- MIBA Bulk Earthworks Boundary
 - NEBP Site Boundary
 - MIBA Bulk Earthworks - Extent of Works
 - Surveyed Habitat Trees to be Retained
 - ⊗ Surveyed Habitat Trees to be Removed

Scale 1:12 500 - Lengths in metres

SOURCE: JWA Site Investigations July 2020;
 KN Group (18-203-MCU27 PHASING.dwg);
 QLD Globe 2019 Aerial Photo
 SCALE: 1 : 12 500 @ A3

JWA Pty Ltd
 Ecological Consultants

CLIENT
 North Harbour Holdings Pty Ltd

PROJECT
 Fauna Management Plan
 NEBP MIBA Bulk Earthworks
 Nolan Drive, Morayfield QLD
 Moreton Bay Regional Council LGA

FIGURE 5A

PREPARED: BW
 DATE: 24 August 2020
 FILE: Q15003_MIBA VFMP_20200824.dwg

TITLE

**MIBA
 HABITAT TREES**



LEGEND

- MIBA Bulk Earthworks Boundary
- NEBP Site Boundary
- MIBA Bulk Earthworks - Extent of Works
- + Surveyed Habitat Trees to be Retained
- + Surveyed Habitat Trees to be Removed
- Tree Protection Zone



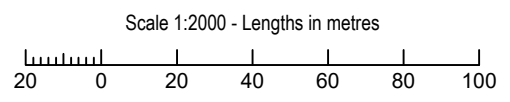
Scale 1:2000 - Lengths in metres

<p>SOURCE: JWA Site Investigations July 2020; KN Group (18-203-MCU27 PHASING.dwg); QLD Globe 2019 Aerial Photo SCALE: 1 : 2000 @ A3</p>	<p>CLIENT North Harbour Holdings Pty Ltd</p> <p>PROJECT Fauna Management Plan NEBP MIBA Bulk Earthworks Nolan Drive, Morayfield QLD Moreton Bay Regional Council LGA</p>	<p>FIGURE 5B</p>	<p>TITLE</p> <p>MIBA HABITAT TREES</p>
<p><i>JWA Pty Ltd</i> Ecological Consultants</p>		<p>PREPARED: BW DATE: 24 August 2020 FILE: Q15003_MIBA VFMP_20200824.dwg</p>	



LEGEND

- MIBA Bulk Earthworks Boundary
- NEBP Site Boundary
- MIBA Bulk Earthworks - Extent of Works
- ✪ Surveyed Habitat Trees to be Retained
- ✪ Surveyed Habitat Trees to be Removed
- Tree Protection Zone



<p>SOURCE: JWA Site Investigations July 2020; KN Group (18-203-MCU27 PHASING.dwg); QLD Globe 2019 Aerial Photo SCALE: 1 : 2000 @ A3</p>	<p>CLIENT North Harbour Holdings Pty Ltd</p> <p>PROJECT Fauna Management Plan NEBP MIBA Bulk Earthworks Nolan Drive, Morayfield QLD Moreton Bay Regional Council LGA</p>	<p>FIGURE 5C</p>	<p>TITLE</p> <p>MIBA HABITAT TREES</p>
<p><i>JWA Pty Ltd</i> Ecological Consultants</p>		<p>PREPARED: BW DATE: 24 August 2020 FILE: Q15003_MIBA VFMP_20200824.dwg</p>	





LEGEND

- MIBA Bulk Earthworks Boundary
- NEBP Site Boundary
- MIBA Bulk Earthworks - Extent of Works
- Surveyed Habitat Trees to be Retained
- Surveyed Habitat Trees to be Removed
- Tree Protection Zone



Scale 1:2000 - Lengths in metres

<p>SOURCE: JWA Site Investigations July 2020; KN Group (18-203-MCU27 PHASING.dwg); QLD Globe 2019 Aerial Photo SCALE: 1 : 2000 @ A3</p>	<p>CLIENT North Harbour Holdings Pty Ltd</p> <p>PROJECT Fauna Management Plan NEBP MIBA Bulk Earthworks Nolan Drive, Morayfield QLD Moreton Bay Regional Council LGA</p>	<p>FIGURE 5E</p>	<p>TITLE</p> <p>MIBA HBAITAT TREES</p>
<p><i>JWA Pty Ltd</i> Ecological Consultants</p>		<p>PREPARED: BW DATE: 24 August 2020 FILE: Q15003_MIBA VFMP_20200824.dwg</p>	

- Koala (*Phascolarctos cinereus*) - **RECORDED**;
- Red goshawk (*Erythrotriorchis radiatus*);
- Swift parrot (*Lathamus discolor*); and
- Water mouse (*Xeromys myoides*).

Eleven (11) migratory fauna species were also considered to be possible occurrences on the subject site:

- Broad-billed sandpiper (*Limicola falcinellus*);
- Cattle egret (*Ardea ibis*);
- Double-banded plover (*Charadrius bicinctus*);
- Fork-tailed swift (*Apus pacificus*);
- Great egret (*Ardea alba*);
- Little curlew (*Numenius minutus*);
- Marsh sandpiper (*Tringa stagnatilis*);
- Oriental plover (*Charadrius veredus*);
- Pectoral sandpiper (*Calidris melanotos*);
- Rainbow bee-eater (*Merops ornatus*); and
- Red-necked stint (*Calidris ruficollis*).

3 Fauna Management Strategies

3.1 Introduction

This section contains species specific management strategies that have been designed to enable the aims of the FMP to be satisfied during both the construction and operational phases. These strategies incorporate general best practice measures to minimise potential adverse impacts on fauna, including significant species.

Additional recommendations for the use of felled timber, retention of conservation areas and reporting procedures are also made.

3.2 Management of Fauna During Construction

In order to ensure the most suitable ecological outcome and to ensure that possible impacts on significant species are minimised, the commencement of site work shall take place in accordance with the following:

1. All contractors and their employees are to be aware of their obligations under this Fauna Management Plan. An appropriately qualified and licenced fauna spotter/catcher shall be present at the pre-start meeting or safety induction to outline the requirements during construction.
2. The contractor will provide access to equipment that may be required by the spotter/catcher (e.g. chainsaw) as well as qualified operators.
3. The operational direction of ground clearing works shall be completed in a manner that ensures maximum fauna movement away from operational works towards areas of retained habitat (**FIGURE 4**). Electric and barbed fencing is not to be utilised within or adjacent to the construction area.
4. The clearing of vegetation and other works will be completed in a direction towards areas of retained vegetation (**FIGURE 4**). This disturbance stimuli will provide fauna with time to leave the site, thus maximising the chances of fauna survival while reducing the need for human intervention for translocation or rescue purposes. The use of temporary fauna proof barrier fencing may be necessary to direct fauna to the fauna relocation area and away from works areas.
5. Immediately prior to any clearing operations and during the felling of any identified habitat trees, the fauna spotter/catcher shall be present to inspect the trees and relocate remaining fauna.
6. Immediately prior to tree removal, the fauna spotter/catcher shall attempt to “flush out” any denning or nesting animals not observed during the initial tree inspection. This may involve hitting target trees with a sledgehammer or other heavy implement. Trees with hollows should be laid on the ground carefully.
7. If any denning or nesting animals are observed within hollow limbs, but cannot be readily removed by the fauna spotter/catcher using the methodology above, a site specific methodology must be identified. It is recommended that in these instances, hollow branches should be removed and placed in a secure location.

The ends of hollows should be plugged prior to removal of the branch. Hollow branches should be transported to the fauna relocation area and unplugged.

8. No tree is to be cleared if wildlife is present, or if the crown of the tree overlaps one in which fauna is present.
9. Following felling, a second inspection of the relevant trees shall be carried out to relocate fauna disturbed by the clearing process or remaining within the felled timber to a suitable location within retained habitat. The relocation area selected should be well vegetated and provide appropriate habitat for the species being released. Nocturnal animals (i.e. bats, gliders, etc.) should be released at dusk. The second inspection will also allow the fauna spotter/catcher to accurately document the number of hollows removed (and requiring replacement with nest boxes).
10. Any injured animals requiring treatment or euthanasia shall be immediately removed and taken to an appropriately qualified veterinary surgeon. Contact details for the nearest veterinary clinics are provided below.

Burpengary Veterinary Hospital

51 Progress Road
Burpengary QLD 4505
(07) 3888 2292

Morayfield Vet Clinic

285 Morayfield Road
Morayfield QLD 4506
(07) 5498 6555

Australia Zoo Wildlife Hospital

1638 Steve Irwin Way
Beerwah QLD 4519
(07) 5436 2097

Any animals requiring support or rehabilitation other than vet assistance will be taken to a qualified wildlife carer or centre.

11. Following the completion of each clearing stage, capture and release records will be supplied to QPWS in accordance with their licensing conditions. A copy of these records, if requested, shall be supplied to Council.
12. A report from the fauna spotter/catcher shall be provided to the clearing contractor and Council Ecologist within two (2) weeks of completion of clearing activities.

3.3 Tree Hollow Salvage and Replacement

Prior to any clearing works, the ecologist will observe trees designated for removal for additional potential hollows as well as any fallen logs that may be providing ground habitat. Any tree hollows removed or ground habitat disturbed during clearing operations should be salvaged and installed within dedicated conservation areas where possible.

In the event that additional hollows are identified and cannot be salvaged, replacement artificial nest boxes of an appropriate size and design will be installed within retained vegetation, avoiding open space or mown areas to reduce the risk of falling nest boxes injuring people.

Replacement fauna nesting boxes will be required at the rate of one (1) nest box for every hollow removed. Where hollows have not yet formed in trees with a diameter greater than 0.8m at 1.3m above the ground, three (3) nest boxes will be required for every habitat tree removed. Nest boxes will be designed for a range of locally occurring hollow dependant fauna species and constructed of materials with a minimum lifespan of 10 years. Where nest boxes are proposed to be installed in revegetation areas, they will be mounted on treated hardwood timber poles.

The ecologist will compile a list of any additional hollows identified and removed in their post-clearing report. This report will assist in determining, installing and monitoring the required artificial nest boxes.

3.4 Fauna Connectivity

In order to ensure the most suitable ecological outcome with regards to fauna connectivity and to ensure that works do not create a barrier to, from or through key environmental areas, the following management strategies will be employed to enhance and maintain connectivity:

- i) Vegetation currently present along what is known locally as the Raff Creek Corridor will be subject to restoration works (Raff Creek Restoration Concept Plan, JWA 2015). Works in this area will also involve flood mitigation works, including land reprofiling for flood storage along with the installation of vegetated detention basins. The crossing over Raff Creek will take the form of a single span bridge. This design was specifically selected to facilitate the passage of fish and other fauna along Raff Creek and associated vegetation.
- ii) Between Lot 2 SP169551 (Category B area) and adjoining Lots and road reserves Tree Protection Zones (TPZ) were estimated. The maximum TPZ required for retained adjoining vegetation were calculated (a sample of trees rather than every single tree were recorded - the largest trees that would have the largest TPZ were sampled). The number of trees from the adjoining denser retained vegetation areas (e.g. Nolan Drive Road Reserve) were estimated. Further detailed information will be provided at a later date (i.e. prior to future earthworks stages). The calculation of the largest TPZs will ensure the appropriate protection of the adjoining Lots and road reserve to maintain ecological connectivity.
- iii) The area along the Caboolture River will be rehabilitated to a width of 100m, which will significantly enhance the environmental corridor and available habitat along the river.
- iv) Rehabilitation works are to be completed between Lot 13 RP145197, Lot 2 RP194131 and the Caboolture River Tributary (which flows from the Southbound

Bruce Highway Interchange at Buchanan Road, through Lot 1 SP266287, and discharges into the Caboolture River). Rehabilitation works will be based on ground levels and will incorporate saltmarsh and other wetland and riparian vegetation as appropriate. A detention basin will also be planted with wetland species. A Rehabilitation plan has been prepared by Place Design Group (2020).

- v) Vegetation is to be retained along the Gympie Creek Tributary (which flows from Cobb Road through Lot 2000 SP309348 and discharges into what is locally known as Raff Creek).

3.5 General Management Protocols for Fauna Groups

3.5.1 Introduction

A brief summary addressing the removal and relocation methods for each broad faunal group is provided in the sections below. Each summary has considered that species observed on site and those species likely to occur in the area to be disturbed.

3.5.2 Amphibians

The occurrence of suitable habitat for amphibians is limited to the creek line in the southeast of the site. Potential habitat areas due to be disturbed will be inspected for the presence of amphibians. In the event that an amphibian is identified in an area of disturbance, the animal will be captured and relocated. To reduce the risk of disease, hygiene protocols will follow the Hygiene Protocol for the Control of Disease in Frogs (DECC 2018). Amphibians will be handled with unused, non-powdered and talc-free gloves. To minimize stress and the risk of death during translocation, translocation will comply with standard operating procedures. Amphibians will be transported in single-use light weight plastic bags and released as soon as possible to reduce stress.

3.5.3 Reptiles

The absence of rocky habitats on-site diminishes the number of reptile species likely to occur on-site, however potential habitat areas due to be disturbed will be inspected for the presence of reptiles. In the event that a reptile is identified in a tree to be removed, the animal will be captured and relocated.

3.5.4 Birds

Birds will be “flushed” from areas of disturbance using appropriate techniques. The majority of birds previously recorded from the site generally occur in the canopy. These birds shall be “flushed” by gently nudging the tree with machinery prior to felling.

In the event that bird eggs are found within a tree to be felled, and are not readily identifiable as belonging to a threatened bird species, the eggs will be removed and taken to a wildlife rehabilitation centre or carer for incubation.

3.5.5 Mammals

As previously discussed, all trees to be removed are to be inspected by a suitably qualified ecologist for denning or nesting animals. All mammals occurring within a tree will be flushed out using the earthworks machinery to nudge the tree. If the animal cannot be “flushed” from the tree the animal will be removed. The animal is to be removed by placing a pillow slip over the hollow end of the branch and removing the limb by chain sawing the other end. Koalas shall not be handled or interfered with in any way, but rather allowed to move on overnight. Refer to **SECTION 3.6.3** for management actions specific to Koalas.

3.5.6 Issues Relating to all Fauna

No dogs are to be permitted on site during clearing works.

3.6 Threatened Species Management Protocols

3.6.1 Introduction

In the event that any Commonwealth or State listed significant fauna species occur on the subject site during clearing operations, the following fauna management actions shall be implemented.

3.6.2 Acid frogs

In the event that any acid frogs (i.e. Wallum froglets) are identified within disturbance areas, whether habitat or otherwise, the acid frogs will be captured and relocated to adjacent habitat. See **Section 4.3.2** for minimising disease risk during translocation.

3.6.3 Koalas

All koala habitat trees with a diameter of 10cm at 1.3m above ground height must only be cleared in the presence of a fauna spotter/catcher with appropriate koala experience. In the event that a koala is identified in any tree marked for removal, whether habitat or otherwise, that tree is not to be removed until the koala has dispersed from the tree and a 10m buffer is to be established within which there is to be no works occurring until the koala has moved on of its own accord. The nudging of trees with koalas is not permitted. The tree can only to be removed following inspection by the fauna spotter/catcher to ensure that the koala has dispersed and that the removal of the tree poses no direct threat to the health or survival of the koala. Koalas are not to be handled.

The Nature Conservation (Koala) Conservation Plan 2017 states that for a clearing site of greater than 6ha, no more than 3ha or 3% of the site’s areas (which ever is the greater) may be cleared in any one stage. Between each stage, a minimum of one period of twelve (12) hours starting at 6pm and finishing at 6am must occur in which no trees are cleared on the site.

3.6.4 Grey-headed flying fox

In the event that a Grey-headed flying fox roost tree is identified, that tree is not to be removed or modified.

3.6.5 Osprey, White-bellied sea eagle, and other threatened arboreal bird species

In the event that these birds are identified in any tree marked for removal, whether habitat or otherwise, that tree must not be removed until the bird(s) has dispersed from the tree. If required, the tree shall be left overnight to enable the bird(s) to move away. The tree shall only to be removed following its inspection by an appropriately qualified ecologist to ensure that the bird(s) have dispersed and that the removal of the tree poses no direct threat to the health or survival of the bird. In the event that eggs are found on site, the tree will be left until juvenile birds have fledged.

3.6.6 Wading and wetland bird species

It is not anticipated that clearing works will directly impact wading and wetland birds, as the majority of this habitat will be retained. However, in the event that these birds are identified in any vegetation marked for removal, that vegetation must not be removed until the bird(s) has dispersed. The vegetation shall only to be removed following inspection by an appropriately qualified ecologist to ensure that the bird(s) have dispersed and that the removal of the vegetation poses no direct threat to the health or survival of the bird. In the event that eggs are found on site, the vegetation will be left until juvenile birds have fledged.

3.6.7 Microbats

In the event that a microbat roost is identified in a tree to be removed, the hollow is to be secured using a piece of towel or rag firmly placed in the entrance of the hollow to prevent escape. Once the hollow entrance is secured the project arborist or fauna spotter/catcher will then cut the entire hollow limb off below the cavity where the branch remains solid. Where required, a small window may be carefully cut into the hollow, allowing the spotter/catcher to plug the hollow above and below the window. The limb can then be lowered to the ground. The limb will then held in a cool, quiet location until translocation to a suitable relocation site the same day of capture, when at dusk the hollow entrance is re-opened to allow the fauna to emerge of its own accord. A replacement bat box will be installed at the release site prior to the release of the microbats in accordance with **SECTION 3.3**.

4 Performance Indicators

1. All Contractors shall be fully aware of their responsibilities under this FMP.
2. All contractors follow the scope of works outlined in the FMP.
3. No native fauna should be injured or killed during clearing operations.
4. Native fauna on site is safely moved to the relocation area.
5. Any injured wildlife is safely transport to a suitable veterinary clinic.

5 Monitoring, Maintenance and Reporting

5.1 General Requirements

The Principal Contractor shall appoint suitable Contractor(s) to undertake the selective clearing operations and, upon request by Council, the Principal Contractor shall submit the appointed Contractor(s) previous work history for perusal if requested.

The Principal Contractor shall monitor vegetation clearance and earthworks components of the Works on a continual basis to confirm that specific controls have been implemented and appropriate work practices are being adopted.

5.2 Fauna Spotter/Catcher Reports

A pre-clearing report shall be provided to Council prior to clearing which will detail any relevant observations made on site including the presence of habitat trees and requirements for the installation of nest boxes (refer to **SECTION 2.5**).

A post-clearing report shall be provided to Council within two (2) weeks of completion of clearing activities. The report shall have at least the following information:

- Conformance with conditions of the FMP;
- The length of time of the clearing;
- Details of any animal/s that were caught and/or sighted and released, and the placement of any released animals;
- Details of any animals that were destroyed due to injury; and
- Any breaches of conditions of the FMP.

6 Summary

JWA Pty Ltd have been engaged by North East Business Park Pty Ltd to complete a Fauna Management Plan (FMP) for the proposed bulk earthworks associated with the Mixed Industry and Business Area (MIBA) within the North East Business Park (NEBP) development.

This FMP provides specific measures for mitigating and/or minimising the potential impacts on fauna as a result of development activities on the subject site and addresses Conditions 26, 27 and 29 of the approval conditions issued by Moreton Bay Regional Council on the 27th February 2020.

Fauna management measures include:

- The use of a suitably qualified fauna spotter/catcher;
- General Fauna Management Protocols for:
 - Amphibians;
 - Reptiles;
 - Birds; and
 - Mammals.
- Tree hollow salvage and replacement;
- Provision/enhancement of fauna connectivity areas;
- Specific Threatened Species Management Protocols for:
 - Acid frogs;
 - Koala;
 - Grey-headed flying fox; and
 - Threatened arboreal birds.

The successful implementation of this plan will result in all native fauna being safely relocated to neighbouring vegetation and that fauna injury or death during clearing operations is avoided.

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APPENDIX 1 - Tree Survey Details

Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
001	Muttonwood	<i>Rapanea variabilis</i>	30	9	8		Retain		Double stem
002	Swamp oak	<i>Casuarina glauca</i>	28	7	3		Retain		
003	Swamp oak	<i>Casuarina glauca</i>	35	15	2		Retain		
004	Swamp oak	<i>Casuarina glauca</i>	30	8	1		Retain		
005	Swamp oak	<i>Casuarina glauca</i>	40	15	4		Retain		
006	Swamp oak	<i>Casuarina glauca</i>	24	8	3		Retain		
007	Swamp oak	<i>Casuarina glauca</i>	35	12	4		Retain		
008	Muttonwood	<i>Rapanea variabilis</i>	28	8	4		Remove		
009	Acacia	<i>Acacia sp.</i>	27	7	5		Retain		Two stems
010	Acacia	<i>Acacia sp.</i>	28	6	4		Retain		Several stems
011	Grey ironbark	<i>Eucalyptus siderophloia</i>	42	19	10		Remove		
012	Grey ironbark	<i>Eucalyptus siderophloia</i>	20	10	3		Remove		
013	Swamp oak	<i>Casuarina glauca</i>	19	15	1		Remove		
014	Swamp oak	<i>Casuarina glauca</i>	19	17	2		Remove		
015	Swamp oak	<i>Casuarina glauca</i>	25	17	2		Remove		
016	Swamp oak	<i>Casuarina glauca</i>	17	15	3		Remove		
017	Swamp oak	<i>Casuarina glauca</i>	15	14	4		Remove		
018	Swamp oak	<i>Casuarina glauca</i>	20	18	3		Remove		
019	Swamp oak	<i>Casuarina glauca</i>	19	16	2		Remove		
020	Swamp oak	<i>Casuarina glauca</i>	23	16	2		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
021	Swamp oak	<i>Casuarina glauca</i>	21	15	4		Remove		
022	Grey ironbark	<i>Eucalyptus siderophloia</i>	23	16	4		Remove		
023	Swamp oak	<i>Casuarina glauca</i>	26	19	3		Remove		
024	Swamp oak	<i>Casuarina glauca</i>	34	18	4		Remove		
025	Swamp oak	<i>Casuarina glauca</i>	15	11	2		Remove		
026	Swamp oak	<i>Casuarina glauca</i>	17	13	3		Remove		
027	Swamp oak	<i>Casuarina glauca</i>	19	13	3		Remove		
028	Swamp oak	<i>Casuarina glauca</i>	17	14	4		Remove		
029	Swamp oak	<i>Casuarina glauca</i>	27	15	5		Remove		
030	Swamp oak	<i>Casuarina glauca</i>	28	16	3		Remove		
031	Swamp oak	<i>Casuarina glauca</i>	15	10	1		Remove		
032	Swamp oak	<i>Casuarina glauca</i>	26	18	4		Remove		
033	Swamp oak	<i>Casuarina glauca</i>	16	14	2		Remove		
034	Swamp oak	<i>Casuarina glauca</i>	15	15	1		Remove		
035	Swamp oak	<i>Casuarina glauca</i>	16	15	2		Remove		
036	Grey mangrove	<i>Avicennia marina</i>	35	11	8		Remove		
037	Grey mangrove	<i>Avicennia marina</i>	16	11	3		Remove		
038	Grey mangrove	<i>Avicennia marina</i>	16	6	7		Remove		
039	Swamp oak	<i>Casuarina glauca</i>	15	12	5		Remove		
040	Grey mangrove	<i>Avicennia marina</i>	30	7	5		Remove		
041	Swamp oak	<i>Casuarina glauca</i>	29	10	5		Remove		
042	Grey mangrove	<i>Avicennia marina</i>	50	8	10		Remove		
043	Swamp oak	<i>Casuarina glauca</i>	15	17	3		Remove		
044	Swamp oak	<i>Casuarina glauca</i>	21	15	4		Remove		
045	Swamp oak	<i>Casuarina glauca</i>	16	16	3		Remove		
046	Grey mangrove	<i>Avicennia marina</i>	30	15	10		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
047	Grey mangrove	<i>Avicennia marina</i>	60	15	13		Remove		
048	Grey mangrove	<i>Avicennia marina</i>	50	15	13		Remove		2 stems
049	Grey mangrove	<i>Avicennia marina</i>	45	14	12		Remove		
050	Grey mangrove	<i>Avicennia marina</i>	20	13	10		Remove		
051	Grey mangrove	<i>Avicennia marina</i>	30	14	9		Remove		
052	Swamp oak	<i>Casuarina glauca</i>	23	15	3		Remove		
053	Swamp oak	<i>Casuarina glauca</i>	15	15	3		Remove		
054	Swamp oak	<i>Casuarina glauca</i>	16	16	2		Remove		
055	Swamp oak	<i>Casuarina glauca</i>	17	17	2		Remove		
056	Swamp oak	<i>Casuarina glauca</i>	15	17	3		Remove		
057	Swamp oak	<i>Casuarina glauca</i>	15	14	5		Remove		
058	Swamp oak	<i>Casuarina glauca</i>	15	14	3		Remove		
059	Swamp oak	<i>Casuarina glauca</i>	20+16+2 2	13	5		Remove		
060	Swamp oak	<i>Casuarina glauca</i>	19+9	16	3		Remove		
061	Swamp oak	<i>Casuarina glauca</i>	17	15	3		Remove		
062	Swamp oak	<i>Casuarina glauca</i>	16	15	2		Remove		
063	Swamp oak	<i>Casuarina glauca</i>	19	15	2		Remove		
064	Swamp oak	<i>Casuarina glauca</i>	17	13	4		Remove		
065	Swamp oak	<i>Casuarina glauca</i>	18	15	2		Remove		
066	Swamp oak	<i>Casuarina glauca</i>	23	18	3		Remove		
067	Swamp oak	<i>Casuarina glauca</i>	19	17	2		Remove		
068	Swamp oak	<i>Casuarina glauca</i>	26	17	4		Remove		
069	Swamp oak	<i>Casuarina glauca</i>	20	16	3		Remove		
070	Grey mangrove	<i>Avicennia marina</i>	35+40	12	12		Remove		
071	Grey mangrove	<i>Avicennia marina</i>	30	8	14		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
072	Grey ironbark	<i>Eucalyptus siderophloia</i>	30	18	6		Remove		
073	Grey ironbark	<i>Eucalyptus siderophloia</i>	29	18	8		Remove		
074	Grey ironbark	<i>Eucalyptus siderophloia</i>	29	19	8		Remove		
075	Grey ironbark	<i>Eucalyptus siderophloia</i>	15	17	4		Remove		
076	Grey ironbark	<i>Eucalyptus siderophloia</i>	30	17	4		Remove		
077	Grey ironbark	<i>Eucalyptus siderophloia</i>	22	15	4		Remove		
078	Grey ironbark	<i>Eucalyptus siderophloia</i>	16	14	3		Remove		
079	Grey ironbark	<i>Eucalyptus siderophloia</i>	60	23	10		Remove		
080	Grey ironbark	<i>Eucalyptus siderophloia</i>	34	19	7		Remove		
081	Grey ironbark	<i>Eucalyptus siderophloia</i>	28	23	3		Remove		
082	Grey ironbark	<i>Eucalyptus siderophloia</i>	29	23	10		Remove		
083	Grey mangrove	<i>Avicennia marina</i>	31+26	12	10		Remove		
084	Grey ironbark	<i>Eucalyptus siderophloia</i>	65	23	14		Remove		
085	Swamp oak	<i>Casuarina glauca</i>	20	11	3		Remove		
086	Grey mangrove	<i>Avicennia marina</i>	25	8	5		Remove		
087	Swamp oak	<i>Casuarina glauca</i>	28	10	4		Remove		
088	Swamp oak	<i>Casuarina glauca</i>	25	5	4		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
089	Grey mangrove	<i>Avicennia marina</i>	29	8	9		Remove		2 stems
090	Swamp oak	<i>Casuarina glauca</i>	27	15	6		Remove		
091	Grey mangrove	<i>Avicennia marina</i>	27	10	6		Remove		
092	Grey mangrove	<i>Avicennia marina</i>	18	10	9		Remove		Multiple stems
093	Grey mangrove	<i>Avicennia marina</i>	32	10	9		Remove		
094	Swamp oak	<i>Casuarina glauca</i>	16	11	2		Remove		
095	Swamp oak	<i>Casuarina glauca</i>	18	12	3		Remove		
096	Swamp oak	<i>Casuarina glauca</i>	21	9	3		Remove		
097	Grey mangrove	<i>Avicennia marina</i>	55	9	7		Remove		Multi stems
098	Swamp oak	<i>Casuarina glauca</i>	18	11	3		Remove		
099	Swamp oak	<i>Casuarina glauca</i>	22	14	2		Remove		
100	Swamp oak	<i>Casuarina glauca</i>	15	11	3		Remove		
101	Grey ironbark	<i>Eucalyptus siderophloia</i>	60	20	11		Retain		
102	Blue gum	<i>Eucalyptus tereticornis</i>	55	24	7		Remove		
103	Blue gum	<i>Eucalyptus tereticornis</i>	60	24	8		Remove		
104	Blue gum	<i>Eucalyptus tereticornis</i>	40	23	10		Remove		
105	Blue gum	<i>Eucalyptus tereticornis</i>	70	26	9		Remove		
106	Blue gum	<i>Eucalyptus tereticornis</i>	95	25	10		Remove		
107	Blue gum	<i>Eucalyptus tereticornis</i>	70	26	10		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/ Retain	Habitat Features	Notes
108	Blue gum	<i>Eucalyptus tereticornis</i>	80	27	12		Retain		
109	Blue gum	<i>Eucalyptus tereticornis</i>	32	16	7		Retain		
110	Blue gum	<i>Eucalyptus tereticornis</i>	35	20	6		Remove		
111	Blue gum	<i>Eucalyptus tereticornis</i>	28	17	8		Remove		
112	Blue gum	<i>Eucalyptus tereticornis</i>	50	19	5		Retain		
113	Blue gum	<i>Eucalyptus tereticornis</i>	40	21	7		Retain		
114	Blue gum	<i>Eucalyptus tereticornis</i>	38	14	5		Retain		
115	Blue gum	<i>Eucalyptus tereticornis</i>	36	16			Retain		
116	Blue gum	<i>Eucalyptus tereticornis</i>	65	18	6		Remove		
117	Blue gum	<i>Eucalyptus tereticornis</i>	25	13	3		Remove		
118	Blue gum	<i>Eucalyptus tereticornis</i>	90	21	9		Remove		
119	Blue gum	<i>Eucalyptus tereticornis</i>	42	13	7		Retain		
120	Blue gum	<i>Eucalyptus tereticornis</i>	45	21	6		Retain		
121	Blue gum	<i>Eucalyptus tereticornis</i>	58	18	8		Retain		
122	Moreton Bay fig	<i>Ficus macrophylla</i>	30	10	5		Retain		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/ Retain	Habitat Features	Notes
123	Blue gum	<i>Eucalyptus tereticornis</i>	55	22	8		Retain		
124	Blue gum	<i>Eucalyptus tereticornis</i>	38	18	6		Retain		
125	Blue gum	<i>Eucalyptus tereticornis</i>	60	19	7		Retain		
126	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	25	13	4		Retain		
127	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	25	10	2		Retain		
128	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	30	10	4		Retain		
129	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	26	10	2		Retain		
130	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	24	10	3		Retain		2 stems
131	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	30	9	4		Retain		
132	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	37	10	5		Retain		
133	Blue gum	<i>Eucalyptus tereticornis</i>	45	18	7		Retain		
134	Swamp oak	<i>Casuarina glauca</i>	28	10	3		Retain		
135	Blue gum	<i>Eucalyptus tereticornis</i>	35	15	6		Retain		
136	Blue gum	<i>Eucalyptus tereticornis</i>	35	19	8		Retain		
137	Swamp oak	<i>Casuarina glauca</i>	26+16+2 8+25	16	5		Retain		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
138	Blue gum	<i>Eucalyptus tereticornis</i>	95	20	10		Retain		
139	Swamp oak	<i>Casuarina glauca</i>	14	13	4		Remove		
140	Swamp oak	<i>Casuarina glauca</i>	28	13	3		Retain		
141	Swamp oak	<i>Casuarina glauca</i>	16	11	3		Retain		
142	Blue gum	<i>Eucalyptus tereticornis</i>	35	18	4		Remove		
143	Swamp oak	<i>Casuarina glauca</i>	35	19	6		Remove		
144	Swamp oak	<i>Casuarina glauca</i>	18	10	4		Remove		
145	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	28	8	3		Remove		
146	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	20+15+10	8	1		Remove		
147	Swamp oak	<i>Casuarina glauca</i>	27	8	3		Remove		
148	Blue gum	<i>Eucalyptus tereticornis</i>	27	10	3		Retain		
149	Moreton Bay fig	<i>Ficus macrophylla</i>	100	22	22		Retain		
150	Moreton Bay fig	<i>Ficus macrophylla</i>	100	22	22		Retain		
151	Moreton Bay fig	<i>Ficus macrophylla</i>	120	22	20		Retain		
152	Moreton Bay fig	<i>Ficus macrophylla</i>	120	21	12		Retain		
153	Kamala	<i>Mallotus philippensis</i>	20	8	3		Remove		
154	Grey ironbark	<i>Eucalyptus siderophloia</i>	25	10	3		Remove		
155	Blue gum	<i>Eucalyptus tereticornis</i>	58	15	9		Retain		
156	Blue gum	<i>Eucalyptus tereticornis</i>	100	17	9		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
157	Blue gum	<i>Eucalyptus tereticornis</i>	60	18	7		Retain		
158	Blue gum	<i>Eucalyptus tereticornis</i>	36	18	5		Retain		
159	Tuckeroo	<i>Cupaniopsis anacardioides</i>	17	6	2		Retain		
160	Blue gum	<i>Eucalyptus tereticornis</i>	58	18	6		Retain		
161	Swamp oak	<i>Casuarina glauca</i>	16	9			Retain		
162	Swamp oak	<i>Casuarina glauca</i>	21	9	3		Retain		
163	Blue gum	<i>Eucalyptus tereticornis</i>	34	14	5		Retain		
164	Blue gum	<i>Eucalyptus tereticornis</i>	65	18	7		Retain		
165	Blue gum	<i>Eucalyptus tereticornis</i>	30	14	5		Remove		
166	Blue gum	<i>Eucalyptus tereticornis</i>	75	19	10		Remove		
167	Blue gum	<i>Eucalyptus tereticornis</i>	35	17	6		Remove		
168	Blue gum	<i>Eucalyptus tereticornis</i>	29	14	4		Remove		
169	Blue gum	<i>Eucalyptus tereticornis</i>	30	15	6		Remove		
170	Red ash	<i>Alphitonia excelsa</i>	26	8	3		Remove		
171	Red ash	<i>Alphitonia excelsa</i>	17	5	5		Remove		
172	Blue gum	<i>Eucalyptus tereticornis</i>	23	7	2		Remove		
173	Acacia	<i>Acacia sp.</i>	17	6	2		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
174	Tuckeroo	<i>Cupaniopsis anacardioides</i>	25	5	3		Remove		
175	Acacia	<i>Acacia sp.</i>	28	5	4		Remove		
176	Tuckeroo	<i>Cupaniopsis anacardioides</i>	27	5	3		Remove		
177	Grey ironbark	<i>Eucalyptus siderophloia</i>	55	21	8		Remove		
178	Blue gum	<i>Eucalyptus tereticornis</i>	55	21	10		Remove		
179	Blue gum	<i>Eucalyptus tereticornis</i>	35	18	4		Remove		
180	Rough-leaved elm	<i>Aphananthe philippinensis</i>	40	10	6		Retain		
181	Dead	<i>Dead</i>	80	8	0	Yes	Remove	Hollows. Very rotten	
182	Blue gum	<i>Eucalyptus tereticornis</i>	50	17	6		Retain		
183	Blue gum	<i>Eucalyptus tereticornis</i>	60	25	12		Retain		
184	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	30+29++ 28+	11	6		Retain		
185	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	60	12	6		Retain		
186	Grey ironbark	<i>Eucalyptus siderophloia</i>	45	25	6		Retain		
187	Grey ironbark	<i>Eucalyptus siderophloia</i>	40	19	5		Retain		
188	Grey ironbark	<i>Eucalyptus siderophloia</i>	55	23	7		Retain		
189	Blue gum	<i>Eucalyptus tereticornis</i>	34	14	4		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
190	Blue gum	<i>Eucalyptus tereticornis</i>	60	16	7		Remove		
191	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	38	15	6		Remove		
192	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	42	15	6		Remove		
193	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	58	18	8		Remove		
194	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	38	15	6		Remove		
195	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	39	16	6		Remove		
196	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	34	16	5		Remove		
197	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	60	16	6		Remove		
198	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	48	14	9		Remove		
199	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	65	15	9		Remove		
200	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	38	13	5		Remove		
201	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	42	16	7		Remove		
202	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	28	16	6		Remove		
203	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	21	12	4		Remove		
204	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	34	16	8		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
205	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	18	14	4		Remove		
206	Blue gum	<i>Eucalyptus tereticornis</i>	48	22	6		Remove		
207	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	12		1		Remove		
208	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	16	14	6		Remove		
209	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	38	16	7		Remove		
210	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	28	16	4		Remove		
211	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	36	20	5		Remove		
212	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	50	21	6		Remove		
213	Pink bloodwood	<i>Corymbia intermedia</i>	35	19	8		Remove		
214	Swamp box	<i>Lophostemon suaveolens</i>	48	12	6		Remove		
215	Grey ironbark	<i>Eucalyptus siderophloia</i>	58	24	11		Remove		
216	Pink bloodwood	<i>Corymbia intermedia</i>	22	15	6		Remove		
217	Pink bloodwood	<i>Corymbia intermedia</i>	22	22	7		Remove		
218	Swamp box	<i>Lophostemon suaveolens</i>	33	17	6		Remove		
219	Swamp box	<i>Lophostemon suaveolens</i>	30	17	4		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
220	Swamp box	<i>Lophostemon suaveolens</i>	29	10	9		Remove		
221	Pink bloodwood	<i>Corymbia intermedia</i>	35	23	9		Remove		
222	Pink bloodwood	<i>Corymbia intermedia</i>	50	27	10		Remove		
223	Grey ironbark	<i>Eucalyptus siderophloia</i>	64	28	10		Remove		
224	Dead	<i>Dead</i>	28	12	0		Remove		
225	Pink bloodwood	<i>Corymbia intermedia</i>	43	28	8		Remove		
226	Swamp box	<i>Lophostemon suaveolens</i>	21	11	5		Remove		
227	Rusty gum	<i>Angophora leiocarpa</i>	48	26	9		Remove		
228	Swamp box	<i>Lophostemon suaveolens</i>	24	14	6		Remove		
229	Pink bloodwood	<i>Corymbia intermedia</i>	13	10	4		Remove		
230	Swamp box	<i>Lophostemon suaveolens</i>	20	13	4		Remove		
231	Swamp box	<i>Lophostemon suaveolens</i>	19	15	4		Remove		
232	Swamp box	<i>Lophostemon suaveolens</i>	24	14	5		Remove		
233	Swamp box	<i>Lophostemon suaveolens</i>	19	16	3		Remove		
234	Pink bloodwood	<i>Corymbia intermedia</i>	27	20	7		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
235	Broad-leaved white mahogany	<i>Eucalyptus carnea</i>	31	15	7		Remove		
236	Grey ironbark	<i>Eucalyptus siderophloia</i>	31	22	10		Remove		
237	Swamp box	<i>Lophostemon suaveolens</i>	30	12	3	Yes	Remove		Hollow
238	Pink bloodwood	<i>Corymbia intermedia</i>	63	22	10	Yes	Remove	Termite mound and potential hollows	
239	Swamp box	<i>Lophostemon suaveolens</i>	25	12	7		Remove		
240	Grey ironbark	<i>Eucalyptus siderophloia</i>	62	27	12		Remove		
241	Swamp box	<i>Lophostemon suaveolens</i>	20	17	6		Remove		
242	Swamp box	<i>Lophostemon suaveolens</i>	38	16	6		Remove		
243	Pink bloodwood	<i>Corymbia intermedia</i>	30	20	8		Remove		
244	Grey ironbark	<i>Eucalyptus siderophloia</i>	40	24	12		Remove		
245	Dead	<i>Dead</i>	26	5	0	Yes	Remove		
246	Pink bloodwood	<i>Corymbia intermedia</i>	26+27	14	8		Remove		
247	Swamp box	<i>Lophostemon suaveolens</i>	35+12	12	5		Remove		
248	Swamp box	<i>Lophostemon suaveolens</i>	23	5	3		Remove		
249	Swamp box	<i>Lophostemon suaveolens</i>	30	14	4		Remove		
250	Dead	<i>Dead</i>	23	10	0	Yes	Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
251	Pink bloodwood	<i>Corymbia intermedia</i>	18+17+1 7	14	9		Remove		
252	Blue gum	<i>Eucalyptus tereticornis</i>	100	26	15	Yes	Remove		
253	Swamp box	<i>Lophostemon suaveolens</i>	21	12	3		Remove		
254	Swamp box	<i>Lophostemon suaveolens</i>	21	11	4		Remove		
255	Swamp box	<i>Lophostemon suaveolens</i>	20	12	4		Remove		
256	Swamp box	<i>Lophostemon suaveolens</i>	24	15	3		Remove		
257	Swamp box	<i>Lophostemon suaveolens</i>	23	15	5		Remove		
258	Swamp box	<i>Lophostemon suaveolens</i>	18	15	3		Remove		
259	Swamp box	<i>Lophostemon suaveolens</i>	10	8	2		Remove		
260	Swamp box	<i>Lophostemon suaveolens</i>	20	16	6		Remove		
261	Pink bloodwood	<i>Corymbia intermedia</i>	27	16	7		Remove		
262	Swamp box	<i>Lophostemon suaveolens</i>	19	17	5		Remove		
263	Swamp box	<i>Lophostemon suaveolens</i>	17	9	2		Remove		
264	Pink bloodwood	<i>Corymbia intermedia</i>	28	23	10		Remove		
265	Swamp box	<i>Lophostemon suaveolens</i>	18	14	7		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
266	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	48	20	10		Remove		
267	Dead	<i>Dead</i>	80	20	0	Yes	Remove		
268	Blue gum	<i>Eucalyptus tereticornis</i>	13	12	3		Remove		
269	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	45	19	5		Remove		
270	Pink bloodwood	<i>Corymbia intermedia</i>	31+28+1 9	23	7		Remove		
271	Swamp box	<i>Lophostemon suaveolens</i>	18	17	4		Remove		
272	Swamp box	<i>Lophostemon suaveolens</i>	29	16	6		Remove		
273	Swamp box	<i>Lophostemon suaveolens</i>	19	18	7		Remove		
274	Grey ironbark	<i>Eucalyptus siderophloia</i>	60	32	17		Remove		
275	Swamp box	<i>Lophostemon suaveolens</i>	42	6	4	Yes	Remove	Hollow	
276	Pink bloodwood	<i>Corymbia intermedia</i>	43	22	6		Remove		
277	Grey ironbark	<i>Eucalyptus siderophloia</i>	48	29	13	Yes	Remove	Hollow	
278	Dead	<i>Dead</i>	15	9	3		Remove		
279	Pink bloodwood	<i>Corymbia intermedia</i>	30	23	11		Remove		
280	Dead	<i>Dead</i>	36	15	4	Yes	Remove	Hollows	
281	Pink bloodwood	<i>Corymbia intermedia</i>	26	18	7		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
282	Swamp box	<i>Lophostemon suaveolens</i>	26	14	5		Remove		
283	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	29	15	5		Remove		
284	Swamp box	<i>Lophostemon suaveolens</i>	28	9	4		Remove		
285	Blue gum	<i>Eucalyptus tereticornis</i>	90	30	15	Yes	Remove	Potential hollows	
286	Grey ironbark	<i>Eucalyptus siderophloia</i>	50	20	12		Remove		
287	Dead	<i>Dead</i>	70	16	3	Yes	Remove		
288	Dead	<i>Dead</i>	80	20	3	Yes	Remove	Hollows	
289	Blue gum	<i>Eucalyptus tereticornis</i>	75	26	12		Remove		
290	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	16+17	14	4		Remove		
291	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	23	17	4		Remove		
292	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	29	20	6		Remove		
293	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	50+33	20	7		Remove		
294	Dead	<i>Dead</i>	40	17	0	Yes	Remove	Hollows	
295	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	48	19	7		Remove		
296	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	29	19	4		Remove		
297	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	29	17	4		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
298	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	29	17	3		Remove		
299	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	59	18	10	Yes	Remove	Potential hollows	
300	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	46	21	7		Remove		
301	Swamp box	<i>Lophostemon suaveolens</i>	22	16	7		Remove		
302	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	48	17	8		Remove		
303	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	27	19	5		Remove		
304	Swamp box	<i>Lophostemon suaveolens</i>	19	20	5		Remove		
305	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	19	18	5		Remove		
306	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	18+14	15	5		Remove		
307	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	28+22	17	7		Remove		
308	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	28	19	5		Remove		
309	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	26	17	6		Remove		
310	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	27	16	7		Remove		
311	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	58	18	9		Remove		
312	Pink bloodwood	<i>Corymbia intermedia</i>	38	19	6	Yes	Remove	Nest	

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
313	Blue gum	<i>Eucalyptus tereticornis</i>	70	27	13	Yes	Remove	Potential hollows	
314	Swamp box	<i>Lophostemon suaveolens</i>	40	18	5		Remove		
315	Swamp box	<i>Lophostemon suaveolens</i>	23	16	3		Remove		
316	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	36	14	5		Remove		
317	Swamp box	<i>Lophostemon suaveolens</i>	29	16	7		Remove		
318	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	55+50	19	12		Remove		
319	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	38	19	11		Remove		
320	Swamp box	<i>Lophostemon suaveolens</i>	25	18	4		Remove		
321	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	47	21	5		Remove		
322	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	40	22	6		Remove		
323	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	48	19	10		Remove		
324	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	37	14	4		Remove		
325	Blue gum	<i>Eucalyptus tereticornis</i>	55	24	9		Remove		
326	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	40	15	9		Remove		
327	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	45+30	18	9		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
328	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	55	18	10		Remove		
329	Blue gum	<i>Eucalyptus tereticornis</i>	35+35	21	7		Remove		
330	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	31	12	10		Remove		
331	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	42	18	5		Remove		
332	Swamp box	<i>Lophostemon suaveolens</i>	20	14	3		Remove		
333	Blue gum	<i>Eucalyptus tereticornis</i>	58	25	10		Remove		
334	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	37	14	8		Remove		
335	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	40	14	8		Remove		
336	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	38	18	7		Remove		
337	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	50	17	8		Remove		
338	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	48	19	5		Remove		
339	Blue gum	<i>Eucalyptus tereticornis</i>	49	22	8		Remove		
340	Grey ironbark	<i>Eucalyptus siderophloia</i>	27	22	4		Remove		
341	Pink bloodwood	<i>Corymbia intermedia</i>	26	15	4		Remove		
342	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	55	17	9		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
343	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	35	17	5		Remove		
344	Blue gum	<i>Eucalyptus tereticornis</i>	47	25	11	Yes	Remove	Potential hollows	
345	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	28	12	4		Remove		
346	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	37	12	9		Remove		
347	Grey ironbark	<i>Eucalyptus siderophloia</i>	39	22	8		Remove		
348	Grey ironbark	<i>Eucalyptus siderophloia</i>	54	22	6	Yes	Remove	Potential hollows	
349	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	30	6	6		Remove		
350	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	28	13	5		Remove		
351	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	40	13	6		Remove		
352	Pink bloodwood	<i>Corymbia intermedia</i>	28	13	8		Remove		
353	Rusty gum	<i>Angophora leiocarpa</i>	19	12	4		Remove		
354	Pink bloodwood	<i>Corymbia intermedia</i>	29	17	6		Remove		
355	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	36	17	7		Remove		
356	Pink bloodwood	<i>Corymbia intermedia</i>	28	20	8		Remove		
357	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	38	22	7		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
358	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	30	9	10		Remove		
359	Grey ironbark	<i>Eucalyptus siderophloia</i>	52	20	9		Remove		
360	Swamp box	<i>Lophostemon suaveolens</i>	47	18	4		Remove		
361	Grey ironbark	<i>Eucalyptus siderophloia</i>	72	30	15		Remove		
362	Pink bloodwood	<i>Corymbia intermedia</i>	29	22	6		Retain		
363	Pink bloodwood	<i>Corymbia intermedia</i>	28	20	6		Retain		
364	Scribbly gum	<i>Eucalyptus racemosa</i>	100	29	10	Yes	Retain	Hollows	
365	Scribbly gum	<i>Eucalyptus racemosa</i>	85	25	9	Yes	Retain	Hollows	
366	Pink bloodwood	<i>Corymbia intermedia</i>	35	23	8		Remove		
367	Blue gum	<i>Eucalyptus tereticornis</i>	85	26	11	Yes	Retain	Hollows	
368	Blue gum	<i>Eucalyptus tereticornis</i>	55	25	9	Yes	Retain	Hollows	
369	Blue gum	<i>Eucalyptus tereticornis</i>	70	25	10	Yes	Retain	Hollows	
370	Blue gum	<i>Eucalyptus tereticornis</i>	50	24	9	Yes	Retain		
371	Pink bloodwood	<i>Corymbia intermedia</i>	45	24	7		Retain		
372	Blue gum	<i>Eucalyptus tereticornis</i>	40	21	11		Retain		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/ Retain	Habitat Features	Notes
373	Blue gum	<i>Eucalyptus tereticornis</i>	35	20	7		Retain		
374	Blue gum	<i>Eucalyptus tereticornis</i>	60	19	7		Retain		
375	Blue gum	<i>Eucalyptus tereticornis</i>	75	22	9	Yes	Retain	Hollows	
376	Blue gum	<i>Eucalyptus tereticornis</i>	60	22	9	Yes	Retain	Hollows	
377	Pink bloodwood	<i>Corymbia intermedia</i>	50	24	10		Retain		
378	Pink bloodwood	<i>Corymbia intermedia</i>	40	23	8	Yes	Retain	Termite mound	
379	Grey ironbark	<i>Eucalyptus siderophloia</i>	50	28	10		Retain		
380	Blue gum	<i>Eucalyptus tereticornis</i>	90	30	14	Yes	Retain	Hollows - lots	
381	Scribbly gum	<i>Eucalyptus racemosa</i>	55	20	6	Yes	Retain	Potential hollows	
382	Pink bloodwood	<i>Corymbia intermedia</i>	45	23	12		Retain		
383	Pink bloodwood	<i>Corymbia intermedia</i>	40	22	10	Yes	Retain	Nest box	
384	Scribbly gum	<i>Eucalyptus racemosa</i>	45	21	12		Retain		
385	Pink bloodwood	<i>Corymbia intermedia</i>	45	30	12	Yes	Retain	Hollows	
386	Blue gum	<i>Eucalyptus tereticornis</i>	40	24	12		Retain		
387	Blue gum	<i>Eucalyptus tereticornis</i>	30	20	7		Retain		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
388	Scribbly gum	<i>Eucalyptus racemosa</i>	65	22	8	Yes	Retain	Hollows	
389	Grey ironbark	<i>Eucalyptus siderophloia</i>	40	27	10		Retain		
390	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	25	24	5		Retain		
391	Scribbly gum	<i>Eucalyptus racemosa</i>	70	22	9	Yes	Retain	Hollows	
392	Blue gum	<i>Eucalyptus tereticornis</i>	40+55	20	10		Remove		
393	Blue gum	<i>Eucalyptus tereticornis</i>	55	24	9		Remove		
394	Blue gum	<i>Eucalyptus tereticornis</i>	22	10	3		Remove		
395	Blue gum	<i>Eucalyptus tereticornis</i>	18	10	2		Remove		
396	Blue gum	<i>Eucalyptus tereticornis</i>	38+28	23	10	Yes	Remove	Hollow	
397	Blue gum	<i>Eucalyptus tereticornis</i>	39	21	9		Remove		
398	Blue gum	<i>Eucalyptus tereticornis</i>	38	16	9		Remove		
399	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	20	14	4		Remove		
400	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	20	14	4		Remove		
401	Blue gum	<i>Eucalyptus tereticornis</i>	16	9	2		Remove		
402	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	15*8ste ms	9	3		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
403	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	20	9	2		Remove		
404	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	20*5stem	10	4		Remove		
405	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	16*4stem	6	3		Remove		
406	Swamp box	<i>Lophostemon suaveolens</i>	10	4	1		Remove		
407	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	15*8stem	6	3		Remove		
408	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	20*3stem	9	3		Remove		
409	Blue gum	<i>Eucalyptus tereticornis</i>	48	20	7		Remove		
410	Blue gum	<i>Eucalyptus tereticornis</i>	50	25	9		Remove		
411	Blue gum	<i>Eucalyptus tereticornis</i>	45	14	4		Remove		
412	Blue gum	<i>Eucalyptus tereticornis</i>	58	25	12		Remove		
413	Pink bloodwood	<i>Corymbia intermedia</i>	45	25	8		Remove		
414	Blue gum	<i>Eucalyptus tereticornis</i>	42	10	2		Remove		
415	Blue gum	<i>Eucalyptus tereticornis</i>	20	17	5		Remove		
416	Grey ironbark	<i>Eucalyptus siderophloia</i>	30	20	8		Remove		
417	Grey ironbark	<i>Eucalyptus siderophloia</i>	30	20	8		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
418	Blue gum	<i>Eucalyptus tereticornis</i>	16	10	2		Remove		
419	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	30	10	4		Remove		

APPENDIX 2 - Habitat Suitability Assessment

LIKELIHOOD OF OCCURRENCE OF THREATENED FAUNA SPECIES ON SUBJECT SITE

Species	Likelihood of occurrence on the Subject site	Notes
Asian dowitcher (<i>Limnodromus semipalmatus</i>)	Unlikely	The Asian Dowitcher occurs in sheltered coastal Environments, such as embayments, coastal lagoons, estuaries and tidal creeks. They are known to frequent shallow water and exposed mudflats or sandflats. The species feeds on inter-tidal mudflats
Australasian bittern (<i>Botaurus poiciloptilus</i>)	Unlikely	The Australasian bittern is widespread but uncommon in south-west and south-east Australia, generally preferring freshwater habitats with tall, dense vegetation with bulrushes and spikerushes.
Australian fritillary (<i>Argynnis hyperbius inconstans</i>)	Unlikely	They are restricted to open, swampy, coastal areas where the larval food plant, <i>Viola betonicifolia</i> , grows as a small, insignificant ground herb in association with <i>Lomandra longifolia</i> (long leaved matrush) and grasses, especially the grass <i>Imperata cylindrica</i> (blady grass). Habitat does not occur on the site.
Australian lungfish (<i>Neoceratodus forsteri</i>)	Unlikely	The Australian Lungfish requires still or slow-flowing, shallow, vegetated pools with clear or turbid water in which to spawn and feed (Allen 1989a; Merrick & Schmida 1984). The species is restricted to areas of permanent water (Brooks & Kind 2002) and cannot live in saline waters or migrate through sea water (Arthington 2009).
Australian painted snipe (<i>Rostratula australis</i>)	Possible	The Painted Snipe occurs in the better watered areas of eastern Australia and the NT. They are generally rare and prefer shallow freshwater swamps or saltmarsh areas.

Species	Likelihood of occurrence on the Subject site	Notes
Bar-tailed godwit (<i>Limosa lapponica baueri</i>)	Unlikely	The Bar-tailed Godwit is found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It is found often around beds of seagrass and, sometimes, in nearby saltmarsh. It has been sighted in coastal sewage farms and saltworks, saltlakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats. It is rarely found on inland wetlands or in areas of short grass, such as farmland, paddocks and airstrips, although it is commonly recorded in paddocks at some locations overseas (Marchant & Higgins 1993).
Black rockcod (<i>Epinephelus daemeli</i>)	Unlikely	The Black Rockcod is found in warm temperate and subtropical parts of the south-western Pacific.
Black-breasted button-quail (<i>Turnix melanogaster</i>)	Unlikely	In north-east NSW, there are few reliable records, all north of the Bruxner Highway and east of the Great Divide. This species prefers drier rainforests and viney scrubs, often in association with Hoop Pine and a deep, moist leaf litter layer.
Black-faced monarch (<i>Monarch melanopsis</i>)	Unlikely	This species occurs in rainforest ecosystems, including semi-deciduous vine-thickets, complex notophyll vine-forest, tropical (mesophyll) rainforest, subtropical (notophyll) rainforest, mesophyll (broadleaf) thicket/shrubland, warm temperate rainforest, dry (monsoon) rainforest and (occasionally) cool temperate rainforest. During winter or migration, this species also occurs in marginal habitats such as 20-30 years old regrowth rainforest, nearby open eucalypt forest (mainly wet sclerophyll forests), especially in gullies with a dense, shrubby understorey as well as dry sclerophyll forests and woodlands, often with a patchy understorey. (Dept. Environment 2012).

Species	Likelihood of occurrence on the Subject site	Notes
Black-tailed godwit (<i>Limosa limosa</i>)	Unlikely	In Australia the Black-tailed Godwit has a primarily coastal habitat environment. The species is commonly found in sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats, or spits and banks of mud, sand or shell-grit; occasionally recorded on rocky coasts or coral islets.
Black-winged stint (<i>Himantopus himantopus</i>)	Unlikely	The Black-winged Stilt is a social species, and is usually found in small groups. Black-winged Stilts prefer freshwater and saltwater marshes, mudflats, and the shallow edges of lakes and rivers.
Broad-billed sandpiper (<i>Limicola falcinellus</i>)	Possible	The Broad-billed Sandpiper occurs in sheltered parts of the coast, favouring estuarine mudflats but also occasionally occur on saltmarshes, shallow freshwater lagoons, saltworks and sewage farms, and in areas with large soft intertidal mudflats, which may have shell or sandbanks nearby. Occasionally they occur on reefs or rocky platforms. They have also been recorded in creeks, swamps and lakes near the coast, particularly those with bare mudflats or sand exposed by receding water.

Species	Likelihood of occurrence on the Subject site	Notes
Cattle egret (<i>Ardea ibis</i>)	Possible	This species inhabits tropical and temperate grasslands, wooded lands and terrestrial wetlands. It uses predominately shallow, open and fresh wetlands including meadows and swamps with low emergent vegetation and abundant aquatic flora. This species often forages away from water on low lying grasslands, improved pastures and croplands. It is commonly found in cattle fields and other farm areas that contain livestock. This species roosts in trees, or amongst ground vegetation in or near lakes and swamps (Dept. Environment 2012).
Collared delma (<i>Delma torquata</i>)	Unlikely	The Collared Delma normally inhabits eucalypt-dominated woodlands and open-forests
Common greenshank (<i>Tringa nebularia</i>)	Unlikely	This species is known to occupy habitat associated with estuaries.
Common noddy (<i>Anous stolidus</i>)	Unlikely	During the breeding season, the Common Noddy usually occurs on or near islands, on rocky islets and stacks with precipitous cliffs, or on shoals or cays of coral or sand.

Species	Likelihood of occurrence on the Subject site	Notes
Common sandpiper (<i>Actitis hypoleucos</i>)	Unlikely	This species utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats. This species has been recorded in estuaries and deltas of streams, as well as on banks farther upstream; around lakes, pools, billabongs, reservoirs, dams and claypans, and occasionally piers and jetties. This species generally forages in shallow water and on bare soft mud at the edges of wetlands; often where obstacles project from substrate, e.g. rocks or mangrove roots. Birds sometimes venture into grassy areas adjoining wetlands. Roost sites are typically on rocks or in roots or branches of vegetation, especially mangroves (Dept. Environment 2012).
Curlew sandpiper (<i>Calidris ferruginea</i>)	Unlikely	Suitable habitat for this species includes tidal reefs and pools, weed-covered rocks, pebbly, shelly and sandy shores with stranded seaweed, and mudflats (Dept. Environment 2012).
Double-banded plover (<i>Charadrius bicinctus</i>)	Possible	The Double-banded Plover is found on littoral, estuarine and fresh or saline terrestrial wetlands and also saltmarsh, grasslands and pasture. It occurs on muddy, sandy, shingled or sometimes rocky beaches, bays and inlets, harbours and margins of fresh or saline terrestrial wetlands such as lakes, lagoons and swamps, shallow estuaries and rivers. The species is sometimes associated with coastal lagoons, inland saltlakes and saltworks.

Species	Likelihood of occurrence on the Subject site	Notes
Dunmall's snake (<i>Furina dunmalli</i>)	Unlikely	<p>Dunmall's Snake has been found in a broad range of habitats, including:</p> <ul style="list-style-type: none"> • Forests and woodlands on black alluvial cracking clay and clay loams dominated by Brigalow (<i>Acacia harpophylla</i>), other Wattles (<i>A. burowii</i>, <i>A. deanii</i>, <i>A. leioclyx</i>), native Cypress (<i>Callitris spp.</i>) or Bull-oak (<i>Allocasuarina luehmannii</i>) (Brigalow Belt Reptiles Workshop 2010; Covacevich et al. 1988; Stephenson & Schmida 2008). • Various Blue Spotted Gum (<i>Corymbia citriodora</i>), Ironbark (<i>Eucalyptus crebra</i> and <i>E. melanophloia</i>), White Cypress Pine (<i>Callitris glaucophylla</i>) and Bulloak open forest and woodland associations on sandstone derived soils (Brigalow Belt Reptiles Workshop 2010; Stephenson & Schmida 2008, Threatened Species Network 2008).
Eastern curlew (<i>Numenius madagascariensis</i>)	Unlikely	This wading species is usually associated with estuaries, bays and lagoons where intertidal mud and sandflats occur. Occasionally also found on beaches, reefs and rocky islets.
Fleay's frog (<i>Mixophyes fleayi</i>)	Unlikely	Fleay's Frog is associated with montane rainforest (Corben & Ingram 1987) and open forest communities adjoining rainforest (Hines 2001, pers. comm.). The species occurs along stream habitats from first to third order streams (i.e. small streams close to their origin through to permanent streams with grades of 1 in 50) and is not found in ponds or ephemeral pools.

Species	Likelihood of occurrence on the Subject site	Notes
Fork-tailed swift (<i>Apus pacificus</i>)	Possible	The Fork-tailed Swift is almost exclusively aerial, flying from less than 1 m to at least 300 m above ground and probably much higher. In Australia, they mostly occur over inland plains but sometimes above foothills or in coastal areas. They often occur over cliffs and beaches and also over islands and sometimes well out to sea. They also occur over settled areas, including towns, urban areas and cities. They mostly occur over dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh. They are also found at treeless grassland and sandplains covered with spinifex, open farmland and inland and coastal sand-dunes. They sometimes occur above rainforests, wet sclerophyll forest or open forest or plantations of pines (DoE 2016).
Giant barred frog (<i>Mixophyes iteratus</i>)	Unlikely	Giant barred frogs forage and live amongst deep, damp leaf litter in rainforests, moist eucalypt forest and nearby dry eucalypt forest, at elevations below 1000m. They breed around shallow, flowing rocky streams from late spring to summer. Suitable habitat does not occur within the study area.
Glossy black cockatoo (<i>Calyptorhynchus lathami</i>)	Unlikely	The Glossy black-cockatoo is found in coastal forests and open inland woodland of eastern Australia. The Glossy Black's distribution is limited to habitat containing sufficient seed reserves of their three favoured species: <i>Allocasuarina littoralis</i> , <i>A. torulosa</i> and <i>A. verticillata</i> (Forshaw, 1981) in addition to suitable large hollow bearing trees for nesting. Suitable habitat exists within the study area.

Species	Likelihood of occurrence on the Subject site	Notes
Great egret (<i>Ardea alba</i>)	Possible	The Great Egret has been reported in a wide range of wetland habitats (for example inland and coastal, freshwater and saline, permanent and ephemeral, open and vegetated, large and small, natural and artificial). These include swamps and marshes; margins of rivers and lakes; damp or flooded grasslands, pastures or agricultural lands; reservoirs; sewage treatment ponds; drainage channels; salt pans and salt lakes; salt marshes; estuarine mudflats, tidal streams; mangrove swamps; coastal lagoons; and offshore reefs. The species usually frequents shallow waters (DoE 2016).
Great knot (<i>Calidris tenuirostris</i>)	Unlikely	In Australasia, the species typically prefers sheltered coastal habitats, with large intertidal mudflats or sandflats. This includes inlets, bays, harbours, estuaries and lagoons. They are occasionally found on exposed reefs or rock platforms, shorelines with mangrove vegetation, ponds in saltworks, at swamps near the coast, saltlakes and non-tidal lagoons. The Great Knot rarely occurs on inland lakes and swamps (Higgins & Davies 1996).
Greater glider (<i>Petauroides volans</i>)	Unlikely	The greater glider is an arboreal nocturnal marsupial, largely restricted to eucalypt forests and woodlands. It is primarily folivorous, with a diet mostly comprising eucalypt leaves, and occasionally flowers. It is typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows. Suitable habitat for this species is not considered to occur on the Subject site.

Species	Likelihood of occurrence on the Subject site	Notes
Greater sand plover (<i>Charadrius leschenaultii</i>)	Unlikely	In the non-breeding grounds in Australasia, the species is almost entirely coastal, inhabiting littoral and estuarine habitats. They mainly occur on sheltered sandy, shelly or muddy beaches with large intertidal mudflats or sandbanks, as well as sandy estuarine lagoons (Bamford 1988; Blakers et al. 1984; Lane 1987; Sibson 1948; Stewart et al. 2007), and inshore reefs, rock platforms, small rocky islands or sand cays on coral reefs (Abbott 1982; Morris 1989; Sedgwick 1978). They are occasionally recorded on near-coastal saltworks and saltlakes, including marginal saltmarsh, and on brackish swamps (C.D.T. Minton 2002 pers.comm; Sibson 1953; Storr 1964b, 1977; Storr et al. 1986). They seldom occur at shallow freshwater wetlands (Storr 1977).
Grey-headed flying fox (<i>Pteropus poliocephalus</i>)	Possible	This species occurs from central eastern Qld south to Victoria. In NSW the Grey-headed flying fox mainly occurs in coastal areas and along river valleys. They typically roost in conspicuous camps in Lowland rainforest and Swamp forest, often in isolated remnants or on islands in rivers. They forage on fruit, nectar and pollen in Rainforests and Eucalypt forests.
Grey plover (<i>Pluvialis squatarola</i>)	Unlikely	In non-breeding grounds in Australia, Grey Plovers occur almost entirely in coastal areas, where they usually inhabit sheltered embayments, estuaries and lagoons with mudflats and sandflats, and occasionally on rocky coasts with wave-cut platforms or reef-flats, or on reefs within muddy lagoons. They also occur around terrestrial wetlands such as near-coastal lakes and swamps, or salt-lakes. The species is also very occasionally recorded further inland, where they occur around wetlands or salt-lakes (Marchant & Higgins 1993 and references therein).

Species	Likelihood of occurrence on the Subject site	Notes
Grey-tailed tattler (<i>Heteroscelus brevipes</i>)	Unlikely	The Grey-tailed Tattler is often found on sheltered coasts with reefs and rock platforms or with intertidal mudflats. It can also be found at intertidal rocky, coral or stony reefs as well as platforms and islets that are exposed at low tide. It has been found around shores of rock, shingle, gravel or shells and also on intertidal mudflats in embayments, estuaries and coastal lagoons, especially fringed with mangroves.
Hooded plover (<i>Thinornis rubricollis rubricollis</i>)	Unlikely	In south-eastern Australia Hooded Plovers prefer sandy ocean beaches, especially those that are broad and flat, with a wide wave-wash zone for feeding, much beachcast seaweed, and backed by sparsely vegetated sand-dunes for shelter and nesting. Occasionally Hooded Plovers are found on tidal bays and estuaries, rock platforms and rocky or sand-covered reefs near sandy beaches, and small beaches in lines of cliffs. They regularly use near-coastal saline and freshwater lakes and lagoons, often with saltmarsh.
Koala (<i>Phascolarctos cinereus</i>)	Possible	The Koala occurs in Eucalypt woodlands and forests throughout eastern Australia. They inhabit areas where there are appropriate food trees. No signs of Koala activity were recorded during surveys. Preferred food trees occur on the site.
Large-eared pied bat (<i>Chalinolobus dwyeri</i>)	Unlikely	This species roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (<i>Hirundo ariel</i>), frequenting low to mid-elevation dry open forest and woodland close to these features. It is usually recorded in well-timbered areas containing gullies. Suitable habitat does not occur within the study area.
Latham's snipe (<i>Gallinago hardwickii</i>)	Unlikely	This species prefers freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies). No suitable habitat is present on this site.

Species	Likelihood of occurrence on the Subject site	Notes
Lesser sand plover (<i>Charadrius mongolus</i>)	Unlikely	Almost entirely coastal in NSW, favouring the beaches of sheltered bays, harbours and estuaries with large intertidal sandflats or mudflats; occasionally occurs on sandy beaches, coral reefs and rock platforms.
Little curlew (<i>Numenius minutus</i>)	Possible	The Little Curlew is most often found feeding in short, dry grassland and sedgeland, including dry floodplains and blacksoil plains, which have scattered, shallow freshwater pools or areas seasonally inundated. Open woodlands with a grassy or burnt understorey, dry saltmarshes, coastal swamps, mudflats or sandflats of estuaries or beaches on sheltered coasts, mown lawns, gardens, recreational areas, ovals, racecourses and verges of roads and airstrips are also used (Higgins & Davies 1996).
Little tern (<i>Sternula albifrons</i>)	Unlikely	Almost exclusively coastal, preferring sheltered environments; however may occur several kilometres from the sea in harbours, inlets and rivers (with occasional offshore islands or coral cay records).
Long-nosed potoroo (<i>Potorous tridactylus</i>)	Unlikely	This species inhabits coastal heaths and dry and wet sclerophyll forests. Dense understorey with occasional open areas is an essential part of habitat, and may consist of grass-trees, sedges, ferns or heath, or of low shrubs of tea-trees or melaleucas. A sandy loam soil is also a common feature.
Magpie goose (<i>Anseranas semipalmata</i>)	Unlikely	Mainly found in shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges. Equally at home in aquatic or terrestrial habitats; often seen walking and grazing on land; feeds on grasses, bulbs and rhizomes.
Marsh sandpiper (<i>Tringa stagnatilis</i>)	Possible	The Marsh Sandpiper lives in permanent or ephemeral wetlands of varying salinity, including swamps, lagoons, billabongs, salt pans, saltmarshes, estuaries, pools on inundated floodplains, and intertidal mudflats and also regularly at sewage farms and saltworks. They are recorded less often at reservoirs, waterholes, soaks, bore-drain swamps and flooded inland lakes

Species	Likelihood of occurrence on the Subject site	Notes
Northern quoll (<i>Dasyurus hallucatus</i>)	Unlikely	The Northern Quoll occupies a diversity of habitats across its range which includes rocky areas, eucalypt forest and woodlands, rainforests, sandy lowlands and beaches, shrubland, grasslands and desert (Threatened Species Scientific Committee 2005aq).
Northern Siberian bar-tailed godwit (<i>Limosa lapponica menzbieri</i>)	Unlikely	The bar-tailed godwit (northern Siberian) occurs mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It has also been recorded in coastal sewage farms and saltworks, saltlakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats (Higgins & Davies 1996).
Oriental cuckoo (<i>Cuculus optatus</i>)	Unlikely	<i>Cuculus optatus</i> (also known as <i>C. saturatus optatus</i>) uses a range of vegetated habitats such as monsoon rainforest, wet sclerophyll forest, open woodlands and appears quite often along edges of forests, or ecotones between forest types (DoE 2016).
Oriental plover (<i>Charadrius veredus</i>)	Possible	Immediately after arriving in non-breeding grounds in northern Australia, Oriental Plovers spend a few weeks in coastal habitats such as estuarine mudflats and sandbanks, on sandy or rocky ocean beaches or nearby reefs, or in near-coastal grasslands, before dispersing further inland (Bigg 1981; Bransbury 1985; Crawford 1972; Murlis et al. 1988; Serventy & Whittell 1976; Storr 1977, 1980, 1984b). Thereafter they usually inhabit flat, open, semi-arid or arid grasslands, where the grass is short and sparse, and interspersed with hard, bare ground, such as claypans, dry paddocks, playing fields, lawns and cattle camps (Boekel 1980; Carruthers 1966; Close 1982; Fletcher 1980; Pedler 1982; Storr 1980), or open areas that have been recently burnt (Boekel 1980; Chatto 2003; Crawford 1972; Garnett 1986; Storr 1977).

Species	Likelihood of occurrence on the Subject site	Notes
Osprey (<i>Pandion haliaetus</i>)	Unlikely	Eastern Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia (Johnstone & Storr 1998; Marchant & Higgins 1993; Olsen 1995). They require extensive areas of open fresh, brackish or saline water for foraging (Marchant & Higgins 1993).
Pacific golden plover (<i>Pluvialis fulva</i>)	Unlikely	In non-breeding grounds in Australia this species usually inhabits coastal habitats, though it occasionally occurs around inland wetlands. Pacific Golden Plovers usually occur on beaches, mudflats and sandflats (sometimes in vegetation such as mangroves, low saltmarsh such as <i>Sarcocornia</i> , or beds of seagrass) in sheltered areas including harbours, estuaries and lagoons, and also in evaporation ponds in saltworks.
Painted honeyeater (<i>Grantiella picta</i>)	Unlikely	Inhabits Boree/ Weeping Myall (<i>Acacia pendula</i>), Brigalow (<i>A. harpophylla</i>) and Box-Gum Woodlands and Box-Ironbark Forests.

Species	Likelihood of occurrence on the Subject site	Notes
Painted snipe (<i>Rostratula benghalensis</i>)	Unlikely	This species inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire; often with scattered clumps of lignum <i>Muehlenbeckia</i> or canegrass or sometimes tea-tree (<i>Melaleuca</i>). The species sometimes utilises areas that are lined with trees, or that have some scattered fallen or washed-up timber. Breeding habitat requirements may be quite specific: shallow wetlands with areas of bare wet mud and both upper and canopy cover nearby. Nest records are all, or nearly all, from or near small islands in freshwater wetlands, provided that these islands are a combination of very shallow water, exposed mud, dense low cover and sometimes some tall dense cover (Dept. Environment 2012).
Pectoral sandpiper (<i>Calidris melanotos</i>)	Possible	Small, migratory wader that prefers shallow fresh to saline wetlands. This species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands.
Pin-tailed snipe (<i>Gallinago sternura</i>)	Unlikely	Most often in or at the edges of shallow freshwater swamps, ponds and lakes with emergent, sparse to dense cover of grass/sedge or other vegetation. The species is also found in drier, more open wetlands such as claypans in more arid parts of species' range. It is also commonly seen at sewage ponds; not normally in saline or inter-tidal wetlands (Higgins & Davies 1996).

Species	Likelihood of occurrence on the Subject site	Notes
Rainbow bee-eater (<i>Merops ornatus</i>)	Possible	The Rainbow Bee-eater occurs mainly in open forests and woodlands, shrublands, and in various cleared or semi-cleared habitats, including mallee, and in open forests that are usually dominated by eucalypts, and farmland and areas of human habitation. It usually occurs in open, cleared or lightly-timbered areas that are often, but not always, located in close proximity to permanent water. It also occurs in inland and coastal sand dune systems, and in mangroves in northern Australia, and has been recorded in various other habitat types including heathland, sedgeland, vine forest and vine thicket, and on beaches (DoE 2016).
Red-capped plover (<i>Charadrius ruficapillus</i>)	Unlikely	The Red-capped Plover is found in wetlands, especially in arid areas, and prefers saline and brackish waters.
Red goshawk (<i>Erythrorchis radiatus</i>)	Possible	The Red Goshawk occurs in coastal and sub-coastal areas in wooded and forested lands of tropical and warm-temperate Australia (Marchant & Higgins 1993). Riverine forests are also used frequently (Debus 1991, 1993).
Red knot (<i>Callidris canutus</i>)	Unlikely	Suitable habitat for this species includes tidal reefs and pools, weed-covered rocks, pebbly, shelly and sandy shores with stranded seaweed, and mudflats (Dept. Environment 2012).
Red-necked avocet (<i>Recurvirostra novaehollandiae</i>)	Unlikely	The Red-necked Avocet is found in large shallow freshwater or saltwater wetlands and estuarine mudflats.

Species	Likelihood of occurrence on the Subject site	Notes
Red-necked stint (<i>Calidris ruficollis</i>)	Possible	In Australasia, the Red-necked Stint is mostly found in coastal areas, including in sheltered inlets, bays, lagoons and estuaries with intertidal mudflats, often near spits, islets and banks and, sometimes, on protected sandy or coralline shores. Occasionally they have been recorded on exposed or ocean beaches, and sometimes on stony or rocky shores, reefs or shoals. They also occur in saltworks and sewage farms; saltmarsh; ephemeral or permanent shallow wetlands near the coast or inland, including lagoons, lakes, swamps, riverbanks, waterholes, bore drains, dams, soaks and pools in saltflats. They sometimes use flooded paddocks or damp grasslands. They have occasionally been recorded on dry gibber plains, with little or no perennial vegetation (Higgins & Davies 1996).
Regent honeyeater (<i>Anthochaera phrygia</i>)	Unlikely	This species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. They prefer woodlands that have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. Every few years non-breeding flocks are seen foraging in flowering coastal Swamp mahogany and Spotted gum forests, particularly on the central coast and occasionally on the upper north coast. This species is very rarely recorded in the locality. However, the Coffs Harbour area is known as a preferred coastal foraging area for this species.
Ruddy turnstone (<i>Arenaria interpres</i>)	Unlikely	In Australasia, the Ruddy Turnstone is mainly found on coastal regions with exposed rock coast lines or coral reefs. It also lives near platforms and shelves, often with shallow tidal pools and rocky, shingle or gravel beaches. It can, however, be found on sand, coral or shell beaches, shoals, cays and dry ridges of sand or coral. It has occasionally been sighted in estuaries, harbours, bays and coastal lagoons, among low saltmarsh or on exposed beds of seagrass, around sewage ponds and on mudflats.

Species	Likelihood of occurrence on the Subject site	Notes
Ruff (<i>Philomachus pugnax</i>)	Unlikely	In Australia the Ruff is found on generally fresh, brackish or saline wetlands with exposed mudflats at the edges. It is found in terrestrial wetlands including lakes, swamps, pools, lagoons, tidal rivers, swampy fields and floodlands. They are occasionally seen on sheltered coasts, in harbours, estuaries, seashores and are known to visit sewage farms and saltworks.
Rufous fantail (<i>Rhipidura rufifrons</i>)	Unlikely	The Rufous Fantail mainly inhabits wet sclerophyll forests, often in gullies dominated by eucalypts such as Tallow-wood (<i>Eucalyptus microcorys</i>), Mountain Grey Gum (<i>E. cypellocarpa</i>), Narrow-leaved Peppermint (<i>E. radiata</i>), Mountain Ash (<i>E. regnans</i>), Alpine Ash (<i>E. delegatensis</i>), Blackbutt (<i>E. pilularis</i>) or Red Mahogany (<i>E. resinifera</i>); usually with a dense shrubby understorey often including ferns. They also occur in subtropical and temperate rainforests, where they have been recorded in temperate Lilly Pilly (<i>Acmena smithi</i>) rainforest, with Grey Myrtle (<i>Backhousia myrtifolia</i>), Sassafras (<i>Doryphora sassafras</i>) and Sweet Pittosporum (<i>Pittosporum undulatum</i>) subdominants. They occasionally occur in secondary regrowth, following logging or disturbance in forests or rainforests. When on passage, they are sometimes recorded in drier sclerophyll forests and woodlands, including Spotted Gum (<i>Eucalyptus maculata</i>), Yellow Box (<i>E. melliodora</i>), ironbarks or stringybarks, often with a shrubby or heath understorey (DoE 2016).
Sanderling (<i>Calidris alba</i>)	Unlikely	In Australia, the species is almost always found on the coast, mostly on open sandy beaches exposed to open sea-swell, and also on exposed sandbars and spits, and shingle banks, where they forage in the wave-wash zone and amongst rotting seaweed.

Species	Likelihood of occurrence on the Subject site	Notes
Satin flycatcher (<i>Myiagra cyanoleuca</i>)	Unlikely	Satin Flycatchers mainly inhabit eucalypt forests, often near wetlands or watercourses. They generally occur in moister, taller forests than the Leaden Flycatcher, <i>Myiagra rebecula</i> , often occurring in gullies. They also occur in eucalypt woodlands with open understorey and grass ground cover, and are generally absent from rainforest. In south-eastern Australia, they occur at elevations of up to 1400 m above sea level, and in the ACT, they occur mainly between 800 m above sea level and the treeline (DoE 2016).
Sharp-tailed sandpiper (<i>Calidris acuminata</i>)	Unlikely	These birds forage on grasslands and mudflats. This species prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline saltlakes inland. They also occur in saltworks and sewage farms. They use flooded paddocks, sedgeland and other ephemeral wetlands, but leave when they dry. They use intertidal mudflats in sheltered bays, inlets, estuaries or seashores, and also swamps and creeks lined with mangroves (Dept. Environment 2017).
Spectacled monarch (<i>Monarch trivirgatus</i>)	Unlikely	The Spectacled Monarch prefers thick understorey in rainforests, wet gullies and waterside vegetation, as well as mangroves. Also inhabits Rainforests, eucalypt woodlands, coastal scrubs, damp gullies in rainforest, eucalypt forest, when migrating, more open woodlands (Birdlife Australia 2016; Pizzey and Knight 2002).

Species	Likelihood of occurrence on the Subject site	Notes
Spotted-tailed quoll (<i>Dasyurus maculatus</i>)	Unlikely	The Spotted-tailed quoll occurs along the escarpments, tablelands and coast of the eastern seaboard. It inhabits a range of habitats including dry and moist sclerophyll forests, woodlands, coastal heathlands and rainforests. The Quolls require large intact habitat patches and are generally only recorded from forested areas of the Great Dividing Range.
Swamp crayfish (<i>Tenuibranchiurus glypticus</i>)	Unlikely	Paperbark swamps and shallow drainage channels. Prefers to burrow into damp clay but is occasionally found in peaty sand.
Swift parrot (<i>Lathamus discolor</i>)	Possible	Mainland populations of this species favour winter-flowering eucalypt forest and woodland, usually where abundant supplies of Eucalypt nectar exist. This species is rarely recorded in the locality.
Swinhoe's snipe (<i>Gallinago megala</i>)	Unlikely	This species inhabits shallow freshwater wetlands of various kinds including paddy fields, swamps and sewage farms, with bare mud or shallow water for feeding, with nearby vegetation cover. This species is also known to occur in grasslands, drier cultivated areas and market gardens (Higgins and Davies 1996). Most species records are from the Northern Territory.
Terek sandpiper (<i>Xenus cinereus</i>)	Unlikely	The Terek Sandpiper mostly forages in the open, on soft wet intertidal mudflats or in sheltered estuaries, embayments, harbours or lagoons. The species has also been recorded on islets, mudbanks, sandbanks and spits, and near mangroves and occasionally in samphire (<i>Halosarcia</i> spp.). Birds are seldom near the edge of water, however, birds may wade into the water (Marchant & Higgins 1993).
Three-toed snake-tooth skink (<i>Saiphos reticulatus</i>)	Unlikely	Rainforest and occasionally moist eucalypt forest, on loamy or sandy soils. The Three-toed Snake-tooth Skink lives in loose soil, leaf litter and rotting logs, and feeds on earthworms and beetle grubs. Garden beds and urban yards under leaf litter on alluvial soils.

Species	Likelihood of occurrence on the Subject site	Notes
Wallum froglet (<i>Crinia tinnula</i>)	Unlikely	The Wallum froglet is found in coastal areas from South-East Qld to the central coast of NSW. It is found only in acid Paperbark swamps and sedge swamps of the coastal 'wallum' country. The Wallum froglet is found in Paperbark swamps growing in areas with acid sandy (Wallum) soils, warm temperate grassland or near the edge of ponds.
Wallum sedge frog (<i>Litoria olongburensis</i>)	Unlikely	This species occurs in coastal areas from Frazer Island in south-east Qld to Yuraygir National Park in northern NSW. It inhabits paperbark swamps and sedge swamps of the coastal 'wallum' country.
Wandering tattler (<i>Tringa incana</i>)	Unlikely	The Wandering Tattler is generally found on rocky coasts with reefs and platforms, points, spits, piers, offshore islands and shingle beaches or beds. It is occasionally seen on coral reefs or beaches, and tends to avoid mudflats (Higgins & Davies 1996). Foraging habitat is among rocks or shingle, or in shallow pools at edges of reefs or beaches, mainly along the tideline. Wandering Tattlers have been recorded roosting or perching on top of boulders surrounded by or close to water (Higgins & Davies 1996).
Water mouse (<i>Xeromys myoides</i>)	Possible	Although the water mouse had been documented in three distinct locations (Northern Territory, central south Queensland, south-east Queensland) they require similar habitat including mangroves and the associated saltmarsh, sedgeland, clay pans, heathlands and freshwater wetlands. The main habitat difference at each location is the littoral, supralittoral and terrestrial vegetation which differs in structure and composition. These differences dictate the species' nesting behaviour.

Species	Likelihood of occurrence on the Subject site	Notes
Whimbrel (<i>Numenius phaeopus</i>)	Unlikely	The Whimbrel is often found on the intertidal mudflats of sheltered coasts. It is also found in harbours, lagoons, estuaries and river deltas, often those with mangroves, but also open, unvegetated mudflats. It is occasionally found on sandy or rocky beaches, on coral or rocky islets, or on intertidal reefs and platforms. It has been infrequently recorded using saline or brackish lakes near coastal areas. It also used saltflats with saltmarsh, or saline grasslands with standing water left after high spring-tides, and in similar habitats in sewage farms and saltfields (Higgins & Davies 1996).
White-bellied sea-eagle	Unlikely	This species has a large distribution range throughout SE QLD and is found in association with coasts, large rivers and estuaries and prefers to nest in large trees adjacent watercourses (Dept. Environment 2012).
White-throated needletail (<i>Hirundapus caudacutus</i>)	Unlikely	The White-throated Needletail is almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. Although they occur over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland. They also commonly occur over heathland, but less often over treeless areas, such as grassland or swamps (DoE 2016).

Species	Likelihood of occurrence on the Subject site	Notes
Wood sandpiper (<i>Tringa glareola</i>)	Unlikely	The Wood Sandpiper uses well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes. They are typically associated with emergent, aquatic plants or grass, and dominated by taller fringing vegetation, such as dense stands of rushes or reeds, shrubs, or dead or live trees, especially Melaleuca and River Red Gums Eucalyptus camaldulensis and often with fallen timber. They also frequent inundated grasslands, short herbage or wooded floodplains, where floodwaters are temporary or receding, and irrigated crops

APPENDIX 7 - VEGETATION MANAGEMENT PLAN (JWA 2020)



VEGETATION MANAGEMENT PLAN

North East Business Park Mixed Industry and Business Area Bulk Earthworks

Lot 1 on SP266287, Lot 2 on SP169551, Lot 11 on SP130251,
Lot 15 on RP902073 and Lot 2000 SP288124
2 and 15 Nolan Drive, Morayfield

A Report Prepared for
North Harbour Holdings Pty Ltd

AUGUST 2020

NEW SOUTH WALES

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DOCUMENT CONTROL

Document

Title	Vegetation Management Plan - MIBA Bulk Earthworks
Job Number	Q15003
File Reference	\\JWAServer\Data\2015 CLIENTS\Q15003_Northeast Business Park, Morayfield\Reports\MIBA VMP and FMP 2020
Version and Date	RW3 27/08/2020
Client	North Harbour Holdings Pty Ltd

Revision History (office use only)

Issue	Version	Draft/ Final	Date	Distributed To	No. Copies	Media	Delivery Method
1	RW1	Draft	07/08/20	JWA	1	.docx	Email
2	RW2	Draft	11/08/20	Client	1	.pdf	Email
3	RW3	FINAL	27/08/20	Client	1	.pdf	Email

Client Issue

Version	Date Sent	Author		Approved by	
		Name	Initials	Name	Initials
RW2	11/08/20	Phoebe Chapman	PC	Adam McArthur	AM
RW3	27/08/20	Phoebe Chapman	PC	Adam McArthur	AM

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1 Introduction

1.1 Background

JWA Pty Ltd has been engaged by North Harbour Holdings Pty Ltd to complete a Vegetation Management Plan (VMP) for the Mixed Industry and Business Area (MIBA) at the North East Business Park (NEBP) site.

The subject site has a current preliminary approval for development allowing mixed industry, business area precincts, open space and related purposes (Court Order No. 911 of 2015, Council Ref. MCU-2002-1079). An operational works application has been submitted with Moreton Bay Regional Council (MBRC) (Council Ref: DA/39447/2019/V4D) to allow for proposed bulk earthworks and vegetation clearing over the MIBA.

This VMP provides specific measures for mitigating and/or minimising the potential impacts on vegetation as a result of development activities on the subject site. The VMP also aims to ensure the long-term health and safety of trees to be retained on site.

1.2 The Subject Site

The site is located at Nolan Drive, Morayfield and is formally described as Lot 1 on SP266287, Lot 2 on SP169551, Lot 11 on SP130251, Lot 15 on RP902073 and Lot 2000 SP309348 (FIGURE 1). The site is approximately 404.79 ha. An aerial photograph of the site is shown in FIGURE 2.

The property is currently used for cattle grazing, with vegetation dominated by a range of native and introduced pasture grasses. Prior to being used for grazing, the site was used for plantation forestry of *Pinus elliottii* (Slash pine). The Caboolture River forms the northern boundary where some mature vegetation is existing along the banks of the river. This vegetation has been planted by NEBP as part of the rehabilitation of the Caboolture River. Small isolated pockets of vegetation are scattered throughout the remainder of the site.

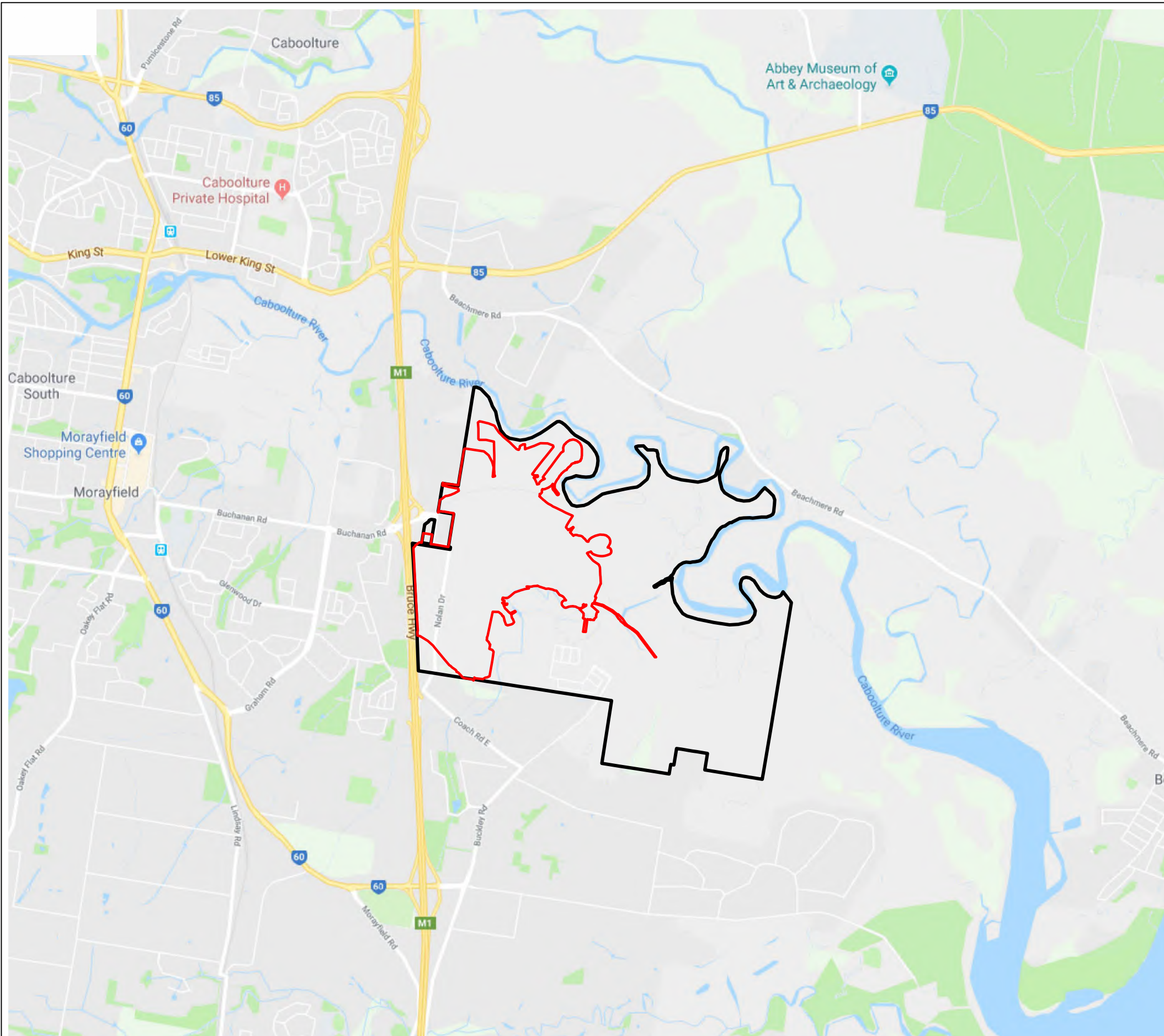
1.3 The Approved Development

The proposed development is for bulk earthworks associated with the MIBA area, works within Raff Creek necessary to remove an existing pipe culvert (and allow for the future extension of Moreton Bay Boulevard) and widen the creek to improve future flood conveyance, and the construction of stormwater treatment wetlands. The extent of bulk earthworks is shown in FIGURE 3.

1.4 Approval Conditions

This VMP addresses Conditions 24 and 28 - 32 of the approval conditions issued by Moreton Bay Regional Council on the 27th February 2020. These conditions are as follows:

24. Amended Document Required



LEGEND
 MIBA Bulk Earthworks Boundary
 NEBP Site Boundary

Scale 1:40 000 - Lengths in metres

SOURCE: Google Maps SCALE: 1 : 40 000 @ A3 <div style="border: 1px solid black; padding: 2px; text-align: center;"> <i>JWA Pty Ltd Ecological Consultants</i> </div>	CLIENT North Harbour Holdings Pty Ltd PROJECT Vegetation Management Plan NEBP MIBA Bulk Earthworks Nolan Drive, Morayfield QLD Moreton Bay Regional Council LGA	<p style="text-align: center;">FIGURE 1</p> PREPARED: BW DATE: 03 August 2020 FILE: Q15003_MIBA VFMP_20200803.dwg	TITLE <p style="text-align: center;">LOCALITY PLAN</p>
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LEGEND
 MIBA Bulk Earthworks Boundary
 NEBP Site Boundary

Scale 1:12 500 - Lengths in metres

SOURCE: QLD Globe 2019 Aerial Photo	CLIENT North Harbour Holdings Pty Ltd	FIGURE 2	TITLE AERIAL PHOTOGRAPH
SCALE: 1 : 12 500 @ A3 <i>JWA Pty Ltd Ecological Consultants</i>	PROJECT Vegetation Management Plan NEBP MIBA Bulk Earthworks Nolan Drive, Morayfield QLD Moreton Bay Regional Council LGA		



LEGEND

- MIBA Bulk Earthworks Boundary
- NEBP Site Boundary
- MIBA Bulk Earthworks - Extent of Works
- Tree Protection Fencing
- Tree Protection Fencing - exact location to be determined onsite

Scale 1:12 500 - Lengths in metres

<p>SOURCE: KN Group (Ref: 18-203-MCU27 PHASING.dwg); QLD Globe 2019 Aerial Photo</p> <p>SCALE: 1 : 12 500 @ A3</p> <div style="border: 1px solid black; padding: 2px; text-align: center; font-size: small;"> <i>JWA Pty Ltd Ecological Consultants</i> </div>	<p>CLIENT North Harbour Holdings Pty Ltd</p> <p>PROJECT Vegetation Management Plan NEBP MIBA Bulk Earthworks Nolan Drive, Morayfield QLD Moreton Bay Regional Council LGA</p>	<p>FIGURE 3</p>	<p>TITLE</p> <p>MIBA BULK EARTHWORKS EXTENT & TREE PROTECTION FENCING</p>
		<p>PREPARED: BW DATE: 24 August 2020 FILE: Q15003_MIBA VFMP_20200824.dwg</p>	

A. *Submit an amended Vegetation Management Plan which clearly demonstrates the following, unless otherwise approved by Council:*

- a) *The protection of trees by being greater than 15m (radius) from the centre of the stem at ground level, outside of the Tree Protection Zone (TPZ) or as calculated by a suitably qualified, AQF Level 5, arborist for vegetation within:*
 - i. *Lot 2 SP169551 - the extent shown as Category B;*
 - ii. *Promimity of the proposed haul road alignment;*
 - iii. *Adjoining properties and road reserves which do not form part of this application.*
- b) *That provides justification where the extent of earthworks requires the removal of any native vegetation, habitat trees and koala habitat trees within:*
 - i. *Lot 17 RP902072;*
 - ii. *Lot 1 SP266287;*
 - iii. *Lot 15 RP902073*

B. *Obtain approval from Council for the amended plans in accordance with (A) above.*

C. *Implement the requirements and recommendations of the approved report(s). The approved amended plan(s) will form part of the approval.*

28. Removal of Noxious Weeds

Carry out removal and maintain the area free from Biosecurity Matter declared under Biosecurity Act 2014 and Regulation(s), and any infestations of undesirable species as listed in Planning Scheme Policy - Integrated design Appendix D - Landscaping. Works must be undertaken by an approved person or company licensed under the Agricultural Chemicals Distribution Act (1970-1996).

30. Extent of Vegetation Clearing

Clearing of native vegetation must be limited to that which is identified in the approved Vegetation Management Plan.

31. Disposal of Cleared Vegetation

Chip, shred or tub grind cleared native vegetation and spread as mulch or dispose of at an authorised waste facility.

32. Stockpiles of Construction and Landscaping Material

Locate any stockpiles of construction and landscaping materials and other site debris clear of environmental areas, tree protection zones, drainage lines and clear of any position from which it could be washed onto any footpath,

1.5 Format of this Management Plan

The plan is structured as follows:

- Vegetation Management Objectives;
- Vegetation Management Strategies; and
- Monitoring and Reporting.

2 Vegetation Management Objectives

1. Tree clearing shall commence as soon as possible after Operational Works approval for the subject site has been granted by Council, and the site has been properly prepared for clearing operations.
2. Tree clearing shall be carried out in accordance with approved documents and Council conditions.
3. Implementation of vegetation clearance, stockpiling, recycling or disposal practices that maximise the re-use of native vegetation and minimises the potential for spreading weed species.
4. If individual trees or other specific vegetation that require protection are identified in land adjacent to a clearance zone, such protection shall be provided.
5. The mulching of weed species will not occur on site. Weed species shall be removed for disposal off-site to minimise the risk of propagation.
6. Prior to the mulching of cleared vegetation stockpiled on site, the stockpile shall be checked for weed species and Myrtle rust and, where fertile weed material or Myrtle rust exists, the material shall be removed for disposal off-site to minimise the risk of spread or propagation.
7. Tree clearing operations shall be completed in a manner that provides maximum protection of the health and livelihood of native fauna. Appropriate fauna management strategies to be employed during clearing operations are addressed in the Fauna Management Plan (JWA 2020).
8. Disposal of cleared vegetation will be managed in an environmentally responsible manner as outlined in **SECTION 3.4**.
9. The retention of mature trees in the proposed development area will be maximised by considering their location during the planning process. Trees planted as part of the developments landscaping will include the same species as the trees that have been removed.

3 Vegetation Management Strategies

3.1 Introduction

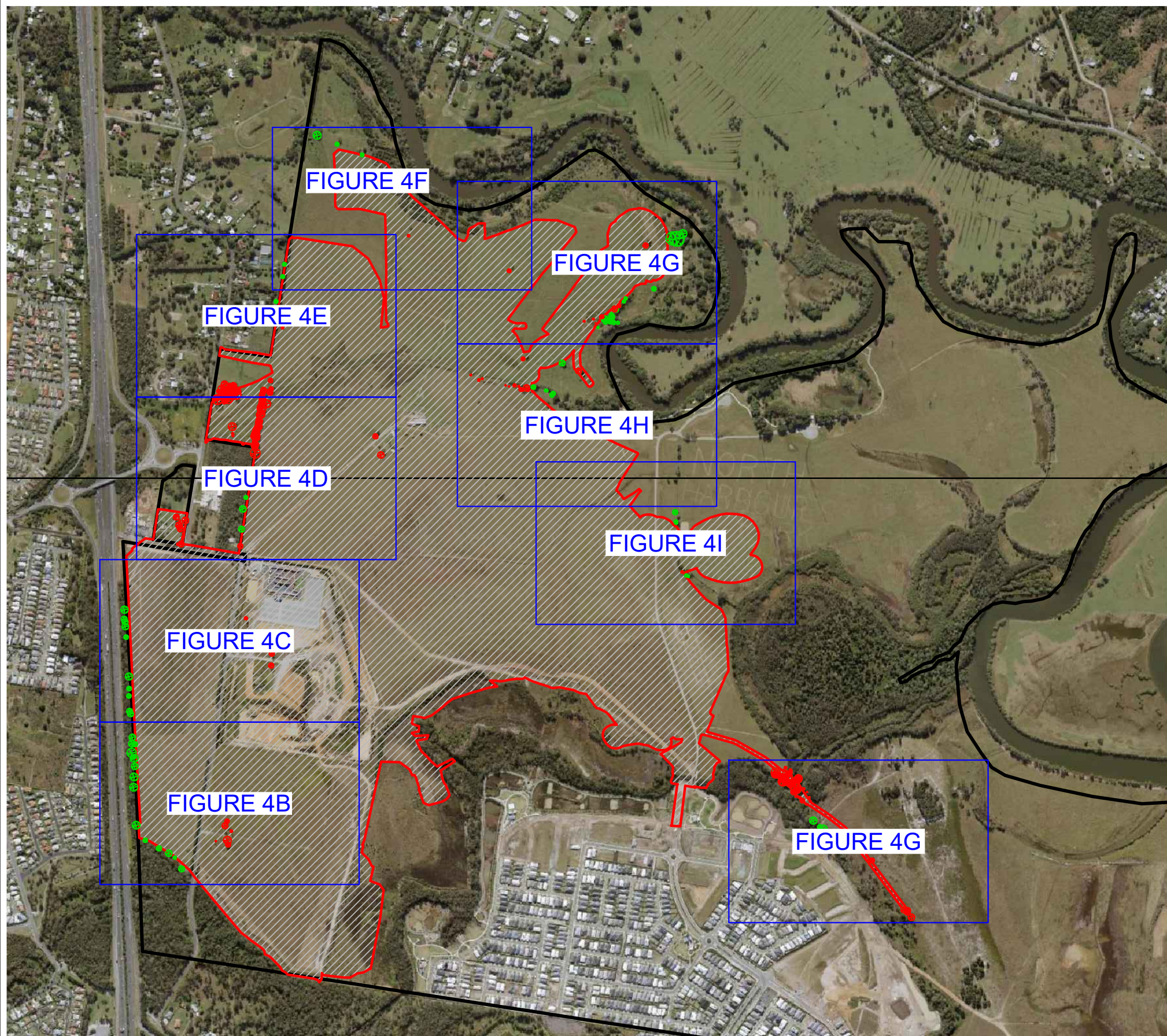
This section identifies vegetation to be retained and removed and contains specific management strategies for mitigating and/or minimising the potential impacts on vegetation to be retained on the subject site.

3.2 Identification of Retained/Removed Vegetation

In order to develop the MIBA within the North Harbour development, the land is required to achieve the finished levels anticipated by the approved MIBA Flood Management Plan. The extents of earthworks need to deliver the necessary finished levels has been detailed by KN Group and approved by Council. The earthworks will significantly alter the current levels of the land and will necessitate the removal of existing vegetation. However, within the 243 ha of earthworks, only 330 trees will be removed the majority of which are juvenile or sub-adult. This is due to the site being previously cleared to allow the land to be used for forestry purposes.

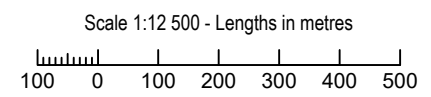
Compliance with the relevant conditions requires significant site works to be completed (e.g. tree surveys) over some areas of the works area, particularly between Nolan Drive and the Bruce Highway. A basic tree survey was completed on the 20th and 28th July 2020 by two (2) JWA ecologists within the paddock areas of the MIBA, as well as a sample of trees within the retained adjoining vegetation. Information collected for each tree included GPS coordinates, species, diameter at breast height (DBH), height, canopy spread and habitat features. The maximum tree protection zones (TPZ) required for retained adjoining vegetation were calculated (a sample of trees rather than every single tree were recorded - the largest trees that would have the largest TPZ were sampled). The number of trees from the adjoining denser retained vegetation areas (e.g. Nolan Drive Road Reserve) were estimated. Further detailed information will be provided at a later date (i.e. prior to future earthworks stages). There are approximately 110 native trees (>10cm DBH) not surveyed within the Nolan Drive road reserve - approximately 35 of these trees were in the southern corner of the road reserve, with a gap and then approximately 75 trees in the north of the reserve. Tree details are provided in **APPENDIX 1** and locations and TPZs are shown on **FIGURE 4**.

Areas of retained vegetation and individual trees will be identified and demarcated prior to the commencement of site preparation works. All retained trees that have the potential to be impacted by development works will be fenced prior to construction works. Tree protection fences shall be installed in accordance with the Australian Standard AS 4970-2009 (Protection of trees on development sites) at the locations shown in **FIGURE 3**. Tree protection fences should be installed under the supervision of a qualified ecologist or arborist, prior to the tree clearing phase.



LEGEND

- MIBA Bulk Earthworks Boundary
- NEBP Site Boundary
- MIBA Bulk Earthworks - Extent of Works
- Surveyed Native Trees to be Retained
- Surveyed Native Trees to be Removed



SOURCE: JWA Site Investigations July 2020;
 KN Group (18-203-MCU27 PHASING.dwg);
 QLD Globe 2019 Aerial Photo
 SCALE: 1 : 12 500 @ A3

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 Vegetation Management Plan
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FIGURE 4A







PREPARED: BW
 DATE: 24 August 2020
 FILE: Q15003_MIBA VFMP_20200803.dwg

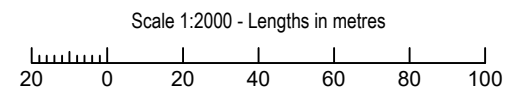
TITLE

MIBA
 TREE SURVEY



LEGEND

-  MIBA Bulk Earthworks Boundary
-  NEBP Site Boundary
-  MIBA Bulk Earthworks - Extent of Works
-  Surveyed Native Trees to be Retained
-  Surveyed Native Trees to be Removed
-  Tree Protection Zone



SOURCE: JWA Site Investigations July 2020;
 KN Group (18-203-MCU27 PHASING.dwg);
 QLD Globe 2019 Aerial Photo
 SCALE: 1 : 2000 @ A3

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FIGURE 4B

PREPARED: BW
 DATE: 24 August 2020
 FILE: Q15003_MIBA VFMP_20200824.dwg

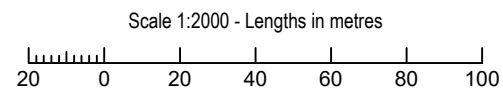
TITLE

**MIBA
 TREE SURVEY**



LEGEND

- MIBA Bulk Earthworks Boundary
- NEBP Site Boundary
- MIBA Bulk Earthworks - Extent of Works
- 🌳 Surveyed Native Trees to be Retained
- 🌳 Surveyed Native Trees to be Removed
- Tree Protection Zone



SOURCE: JWA Site Investigations July 2020;
 KN Group (18-203-MCU27 PHASING.dwg);
 QLD Globe 2019 Aerial Photo
 SCALE: 1 : 2000 @ A3

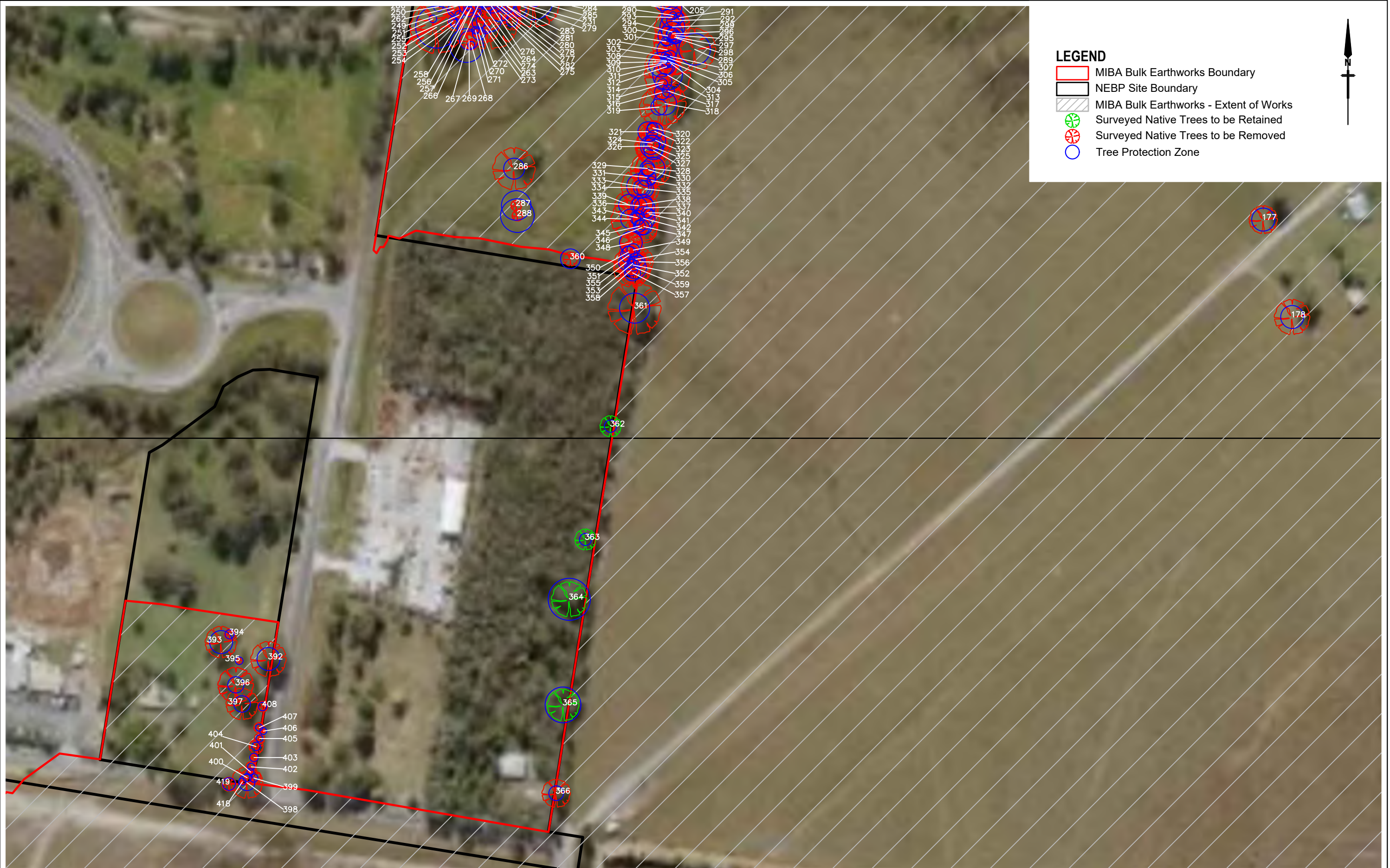
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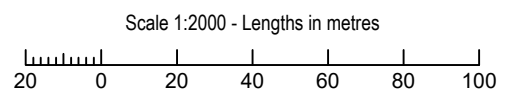
FIGURE 4C

PREPARED: BW
 DATE: 24 August 2020
 FILE: Q15003_MIBA VFMP_20200824.dwg

TITLE
**MIBA
 TREE SURVEY**



- LEGEND**
- MIBA Bulk Earthworks Boundary
 - NEBP Site Boundary
 - MIBA Bulk Earthworks - Extent of Works
 - Surveyed Native Trees to be Retained
 - Surveyed Native Trees to be Removed
 - Tree Protection Zone

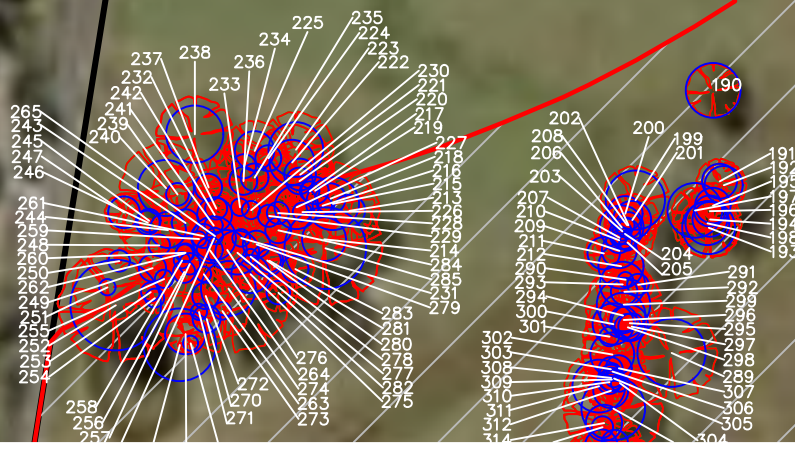


<p>SOURCE: JWA Site Investigations July 2020; KN Group (18-203-MCU27 PHASING.dwg); QLD Globe 2019 Aerial Photo SCALE: 1 : 2000 @ A3</p>	<p>CLIENT North Harbour Holdings Pty Ltd PROJECT Vegetation Management Plan NEBP MIBA Bulk Earthworks Nolan Drive, Morayfield QLD Moreton Bay Regional Council LGA</p>	<p>FIGURE 4D</p> <p>PREPARED: BW DATE: 24 August 2020 FILE: Q15003_MIBA VFMP_20200824.dwg</p>
<p>JWA Pty Ltd Ecological Consultants</p>		<p>TITLE</p> <p>MIBA TREE SURVEY</p>



LEGEND

- MIBA Bulk Earthworks Boundary
- NEBP Site Boundary
- MIBA Bulk Earthworks - Extent of Works
- 🌳 Surveyed Native Trees to be Retained
- 🌳 Surveyed Native Trees to be Removed
- Tree Protection Zone



Scale 1:2000 - Lengths in metres

SOURCE: JWA Site Investigations July 2020;
 KN Group (18-203-MCU27 PHASING.dwg);
 QLD Globe 2019 Aerial Photo
 SCALE: 1 : 2000 @ A3

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FIGURE 4E

PREPARED: BW
 DATE: 24 August 2020
 FILE: Q15003_MIBA VFMP_20200824.dwg

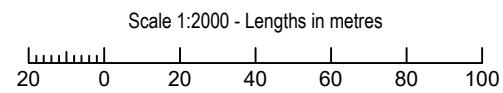
TITLE

**MIBA
 TREE SURVEY**



LEGEND

- MIBA Bulk Earthworks Boundary
- NEBP Site Boundary
- MIBA Bulk Earthworks - Extent of Works
- ✕ Surveyed Native Trees to be Retained
- ✕ Surveyed Native Trees to be Removed
- Tree Protection Zone



SOURCE: JWA Site Investigations July 2020;
 KN Group (18-203-MCU27 PHASING.dwg);
 QLD Globe 2019 Aerial Photo
 SCALE: 1 : 2000 @ A3

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 NEBP MIBA Bulk Earthworks
 Nolan Drive, Morayfield QLD
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FIGURE 4F

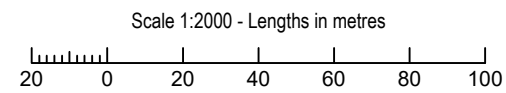
PREPARED: BW
 DATE: 24 August 2020
 FILE: Q15003_MIBA VFMP_20200824.dwg

TITLE
**MIBA
 TREE SURVEY**



LEGEND

- MIBA Bulk Earthworks Boundary
- NEBP Site Boundary
- MIBA Bulk Earthworks - Extent of Works
- 🌳 Surveyed Native Trees to be Retained
- 🌳 Surveyed Native Trees to be Removed
- Tree Protection Zone



SOURCE: JWA Site Investigations July 2020;
 KN Group (18-203-MCU27 PHASING.dwg);
 QLD Globe 2019 Aerial Photo
 SCALE: 1 : 2000 @ A3

JWA Pty Ltd
 Ecological Consultants

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 North Harbour Holdings Pty Ltd
 PROJECT
 Vegetation Management Plan
 NEBP MIBA Bulk Earthworks
 Nolan Drive, Morayfield QLD
 Moreton Bay Regional Council LGA

FIGURE 4G

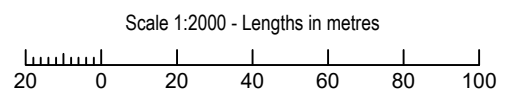
PREPARED: BW
 DATE: 24 August 2020
 FILE: Q15003_MIBA VFMP_20200824.dwg

TITLE
**MIBA
 TREE SURVEY**



LEGEND

- MIBA Bulk Earthworks Boundary
- NEBP Site Boundary
- MIBA Bulk Earthworks - Extent of Works
- Surveyed Native Trees to be Retained
- Surveyed Native Trees to be Removed
- Tree Protection Zone



SOURCE: JWA Site Investigations July 2020;
 KN Group (18-203-MCU27 PHASING.dwg);
 QLD Globe 2019 Aerial Photo
 SCALE: 1 : 2000 @ A3

JWA Pty Ltd
 Ecological Consultants

CLIENT
 North Harbour Holdings Pty Ltd

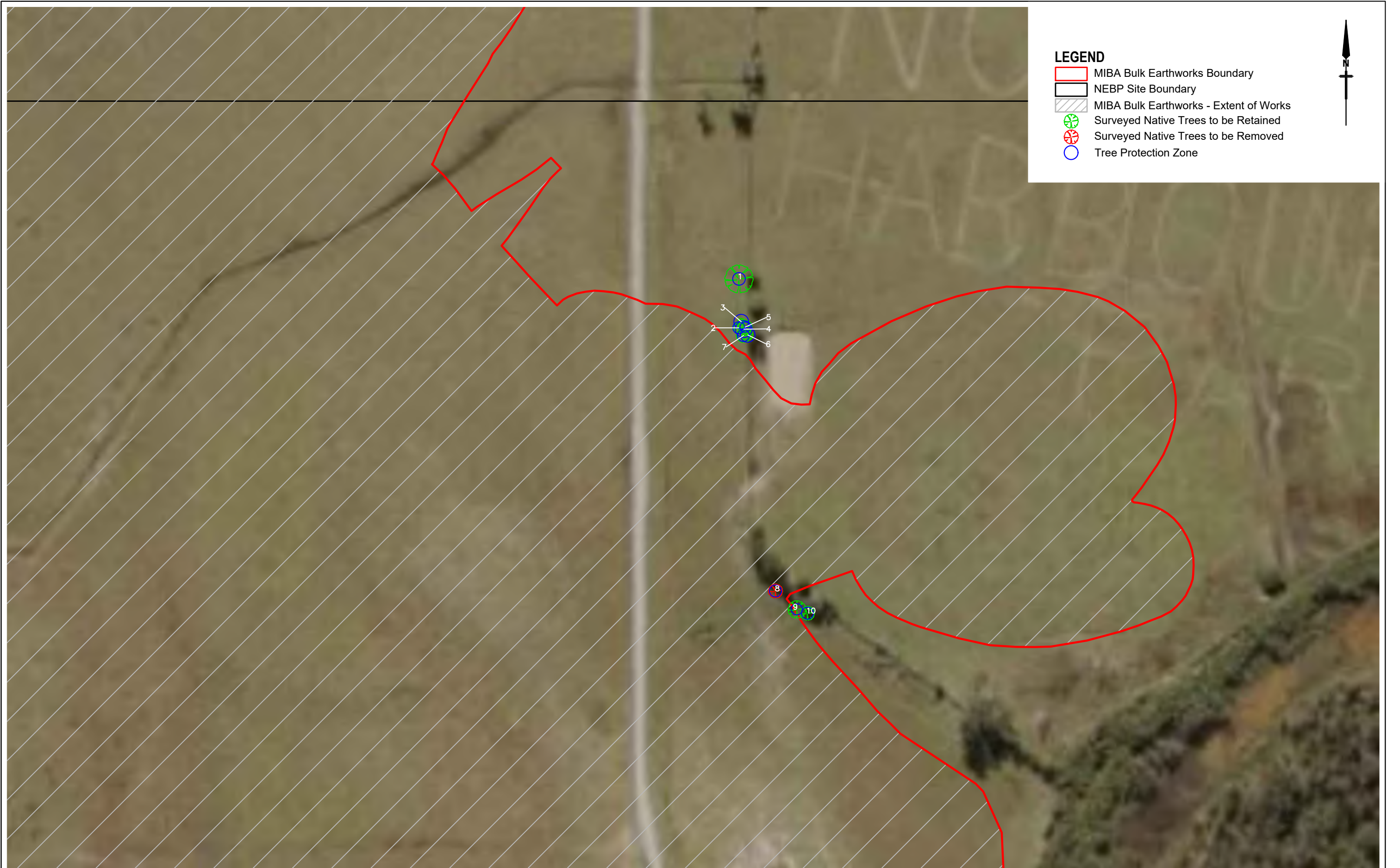
PROJECT
 Vegetation Management Plan
 NEBP MIBA Bulk Earthworks
 Nolan Drive, Morayfield QLD
 Moreton Bay Regional Council LGA

FIGURE 4H

PREPARED: BW
 DATE: 24 August 2020
 FILE: Q15003_MIBA VFMP_20200824.dwg

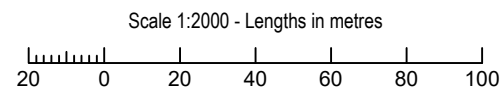
TITLE

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FIGURE 4I

PREPARED: BW
 DATE: 24 August 2020
 FILE: Q15003_MIBA VFMP_20200824.dwg

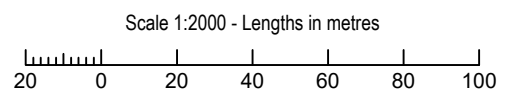
TITLE

**MIBA
 TREE SURVEY**



LEGEND

- MIBA Bulk Earthworks Boundary
- NEBP Site Boundary
- MIBA Bulk Earthworks - Extent of Works
- Surveyed Native Trees to be Retained
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SOURCE: JWA Site Investigations July 2020;
 KN Group (18-203-MCU27 PHASING.dwg);
 QLD Globe 2019 Aerial Photo
 SCALE: 1 : 2000 @ A3

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 Vegetation Management Plan
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 Moreton Bay Regional Council LGA

JWA Pty Ltd
 Ecological Consultants

FIGURE 4J

PREPARED: BW
 DATE: 24 August 2020
 FILE: Q15003_MIBA VFMP_20200824.dwg

TITLE

**MIBA
 TREE SURVEY**

3.3 Vegetation Protection Guidelines

All retained vegetation likely to be impacted by construction works will be managed in accordance with the following tree protection guidelines. These procedures will ensure that retained trees adjacent to development areas will survive construction works and will remain in a healthy condition. The procedures will also ensure that any activity taking place within the drip line of any retained tree will not significantly impact on the survival of the tree.

In order to protect retained vegetation, the following procedures are to be followed:

1. *Identifying a Tree Protection Zone:* All retained trees likely to be impacted upon by development works will be marked prior to construction works. The size and shape of a particular protection zone will vary according to individual tree species. The zone will be determined prior to commencing the project and will remain in place until project completion.
2. *Pruning:* Prior to establishing a tree protection zone, trees to be protected will be pruned focusing on removal of dead or broken branches. The purpose of this activity is primarily safety, but it serves as a monitor for any damage that may occur during construction. Any pruning works are to be carried out by a qualified arboriculturist (minimum AQF Level 5 Diploma in Arboriculture). All works will adhere to the Australian Standards (AS) 4373 - 1996 (Pruning of Amenity Trees).
3. *Establishing the Tree Protection Zone:* The following measures will be taken to protect the tree in the long term:
 - Fencing - Temporary fencing consisting of high visibility webbing and star pickets will be installed at the edge of works line prior to construction works. Temporary fencing will remain in place until all tree clearing and earthworks within or immediately adjacent to the retained vegetation have been completed. Silt fencing will be placed at the bottom of any batters within the waterway as appropriate.
 - Trunk protection - 1.8m high palings strapped to the trunk.
 - Mulching - 100 mm of composted mulch cover over the ground within the tree protection zone in order to retain soil moisture and encourage microbial activity.
 - Irrigation - natural moisture levels should be maintained.
 - Drainage - the natural drainage patterns around the root zone should not be altered.
 - Signage - as follows:
 - Tree Protection zone
 - No vehicle movement
 - No storage of building materials
 - No washing of equipment

- Contact name and number for enquires.
4. *Pre-start meeting: Prior to commencement of clearing works, the applicant will arrange a pre-start meeting with Moreton Bay Regional Council Development Assessment Officers. Prior to the pre-start meeting, the applicant (or appointed contractor) should ensure that the relevant fencing along the boundary of the retained vegetation is installed.*
 5. *Activities within the Tree Protection Zone: No activities will be undertaken within the tree protection zones (TPZs) without the supervision of a suitably qualified arborist. Council is to be notified if any activity is likely to adversely impact on the health of retained trees. Within the retained vegetation the following activities shall not be permitted:*
 - storage and mixing of materials;
 - vehicle parking;
 - liquid disposal;
 - machinery repairs and/or refuelling;
 - construction site office or shed;
 - combustion of any material;
 - stockpiling of soil, rubble or debris;
 - any filling or excavation including trench line, topsoil skimming and/or surface excavation, unless otherwise approved by a suitably qualified arborist; and
 - unauthorised pesticide, herbicide or chemical applications.
 6. *Trenching and Excavation: When trenching or excavation is to be undertaken within the root zone of any tree, roots will be severed cleanly rather than torn with a backhoe or other excavation equipment. All roots are to be exposed first and then cut cleanly with a sharp saw or loppers. Exposed roots are to be kept moist and covered with hessian for the duration of the exposure. Where roots with a diameter larger than 50mm are encountered excavation should be undertaken by hand or small implements.*
 7. *Activities Adjacent to Retained Trees: All activities in an area adjacent to any retained tree or area are to be carried out in such a manner as to minimise any damage to trees. Trees to be removed will be felled in a direction away from trees to be retained. Where an individual tree to be retained may be impacted by the removal of another tree located at close proximity, the roots of the tree to be disturbed (and the tree to be retained, where required) are to be severed cleanly by a suitably qualified arborist. All roots are to be exposed first and then cut cleanly with a sharp saw or loppers.*
 8. *Clearing Works: Site works shall occur in the following sequence; cutting, shearing of felled vegetation and tub grinding. Where vegetation is cleared or removed, vegetation waste shall be mulched and retained on site for re-use in landscape works. Each area is to be mulched immediately upon completion of*

clearing and grubbing works. Any vegetation not suitable for mulching (i.e. fertile material from weed species) will not be mulch and will be transported to an appropriate facility.

Hollow logs shall not be mulched until inspected by a qualified Ecologist. If any hollow logs are located on site they will be relocated to areas proposed for landscaping.

9. *Disposal of Debris:* Clearing and disposal of vegetation to be in accordance with Council requirements and conditions. Vegetation will be mulched and reused on site, where possible. Prior to the commencement of operational works all rubbish and foreign matter from the area is to be removed and appropriately disposed of off-site.
10. *Monitoring and Reporting:* Monthly site inspections will be completed to ensure that protection measures are being implemented. Inspections are to be coordinated with the construction supervisor to ensure that where practical supervision for works within TPZ's is combined with the general assessment of protection measures. Inspections will be undertaken and documented by a suitably qualified arborist. Records of all inspections are to be provided to the applicant.

3.4 Disposal of Debris

Prior to the commencement of operational works all rubbish and foreign matter is to be removed and appropriately disposed of off-site.

Where vegetation is cleared or removed, vegetation waste shall be mulched and retained on site for re-use in landscape and rehabilitation works. Any vegetation not suitable for mulching i.e. fertile weed specimens will be transported to an appropriate facility.

Clearing and disposal of vegetation is to be in accordance with Council requirements and conditions. Pit burning of cleared vegetation is strictly prohibited as is the burning of other refuse/waste on site.

3.5 Stockpile Locations

Cleared vegetation and site mulch will be stockpiled/stored on site within the development area. Storage or stockpiling must not occur within tree protection zones.

3.6 Weed Species Management

3.6.1 Introduction

The focus for weed management is the removal of existing weeds and prevention of further infestations. Weeding is to commence during or immediately following site preparation works.

3.6.2 Weeds on Site

A number of weeds have been recorded on the site. The following are some of the major weed species identified:

- Camphor laurel* (*Cinnamomum camphora*) - Class 3 declared weed;
- Lantana* (*Lantana camara*) - Class 3 declared weed, WoNS;
- Slash pine* (*Pinus elliottii*); and
- Broad-leaf pepper tree* (*Schinus terebinthifolius*) - Class 3 declared weed.

3.6.3 Weed Species Management Protocols

The weed species management protocols are as follows:

1. No soil disturbance is to occur within areas of retained vegetation. Soil disturbance within retained vegetation and any areas to be landscaped shall be kept to a minimum to avoid weed recruitment.
2. All nursery stock for landscaping purposes shall be weed, pest and disease free and certified as such by the supplier where feasible. The certificates are to be obtained prior to the commencement of any regeneration/revegetation works on site.
3. All mulch produced on site (by mulching cleared vegetation and trees) shall specifically exclude fertile material from weed species (where a risk of proposition exists) and be stored outside of the retained vegetation. Vegetation mulching will be suitably controlled to avoid contamination. Any fertile weed material will be transported from the site to an approved disposal facility.
4. Weed or potential weed species shall not be planted during landscaping operations.
5. Weeds on the subject site will be managed using suitable control measures (i.e. chemical and/or physical control).
6. Clearing operations are to ensure that propagative material from cleared weeds does not spread across the site. The earthworks machinery must not introduce weed material to the site or spread such material throughout the site.

4 Monitoring and Reporting

4.1 Introduction

This section provides details of the performance indicators, controls and corrective actions, and the monitoring and reporting requirements under this VMP. Success of the VMP will be monitored and assessed against the performance indicators.

4.2 Performance Indicators

The following performance indicators will be used to assess the effectiveness of the VMP:

1. All contractors are to be fully aware of responsibilities under this VMP and other relevant management plans.
2. Tree protection fencing erected in accordance with the Vegetation Protection Guidelines (**SECTION 3.3**).
3. No retained trees will be damaged or removed during construction or rehabilitation activities.
4. No unauthorised activities to be undertaken within tree protection zones as listed in **SECTION 3.3**.

4.3 Controls and Corrective Actions

The following controls and corrective actions will be implemented:

1. All contractors will be supervised by an onsite representative from the Applicant.
2. Relevant provisions of Local, State and Commonwealth Government Legislation/Policies to be adhered to by the Contractor.
3. A copy of the approved Vegetation Management Plan, approved documents and Council's conditions shall be retained on site at all times.
4. Contractors undertaking site works, including tree removal are to be instructed directly of all Council's relevant conditions prior to works commencing.
5. The boundary of the retained vegetation will be clearly defined by fencing. Taping (red colour) may also be utilised during the construction phase to ensure the boundary fencing is highly visible.
6. The Contractor shall provide fences and/or trunk girdles to prevent unintended physical damage to the root system, trunk or canopy of native vegetation identified for retention, which may be impacted upon by clearing works. All vegetation protection fencing must remain on site until all operational works are completed.
7. All works carried out on either foliage or root systems of trees to be retained are to be in consultation with a qualified arborist or horticulturist. All works must adhere to the *Australian Standards (AS) 4373 - 1996 (Pruning of amenity trees)*. The subject trees are not to be topped nor lopped. Spur climbing of any tree to be pruned should also be avoided.

8. Any area disturbed by construction ancillary to the approval must be restored and rehabilitated to the satisfaction of the MBRC Assessment Manager.
9. All vegetation management works shall be carried out so as not to offend any conditions of the approved sediment and erosion control plan for the site.

4.4 Monitoring and Reporting Requirements

The Applicant shall appoint suitable Contractor(s) to undertake the clearing operations. The contractor shall monitor vegetation clearance and earthworks components of the proposed works on a continual basis to confirm that specific controls have been implemented and appropriate work practices are being adopted to achieve the Vegetation Management Objectives specified in **SECTION 2**.

The Applicant shall be responsible for periodic condition monitoring of all retained vegetation. Monitoring will address the health and vigour of all retained vegetation. Inspections will be undertaken and documented by a suitably qualified Ecologist. Monitoring visits should also be completed following any flood events to check for impacts to plants, sediment control, fencing and mulch distribution. Issues should be rectified as soon as practicable.

Records of all inspections are to be provided to the Applicant.

The Contractor shall formally report to the Applicant on a weekly basis. The report will discuss the following:

1. Works undertaken;
2. Progress against stated objectives;
3. Compliance with Performance Indicators;
4. Significant problems encountered;
5. Success or failures of measures implemented to rectify previously identified problems; and
6. Measures to be taken to rectify new problems.

5 Summary and Conclusion

JWA Pty Ltd has been engaged by North Harbour Holdings Pty Ltd to complete a Vegetation Management Plan (VMP) for the Mixed Industry and Business Area (MIBA) at the North East Business Park (NEBP) site. The subject site has a current preliminary approval for development allowing mixed industry, business area precincts, open space and related purposes (Court Order No. 911 of 2015, Council Ref. MCU-2002-1079). An operational works application has been submitted with Moreton Bay Regional Council (MBRC) (Council Ref: DA/39447/2019/V4D) to allow for proposed bulk earthworks and vegetation clearing over the MIBA.

This VMP provides specific measures for mitigating and/or minimising the potential impacts on vegetation as a result of development activities on the subject site. The VMP also aims to ensure the long-term health and safety of trees to be retained on site.

Specific actions include:

- Identification and demarcation of retained and removed vegetation;
- The use of fencing to protect retained vegetation;
- The management of weeds on the site; and
- Monitoring and reporting against performance indicators.

The implementation of this VMP will result in the minimisation of impacts on retained vegetation due to development activities on the subject site.

APPENDIX 1: Tree Details

Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
001	Muttonwood	<i>Rapanea variabilis</i>	30	9	8		Retain		Double stem
002	Swamp oak	<i>Casuarina glauca</i>	28	7	3		Retain		
003	Swamp oak	<i>Casuarina glauca</i>	35	15	2		Retain		
004	Swamp oak	<i>Casuarina glauca</i>	30	8	1		Retain		
005	Swamp oak	<i>Casuarina glauca</i>	40	15	4		Retain		
006	Swamp oak	<i>Casuarina glauca</i>	24	8	3		Retain		
007	Swamp oak	<i>Casuarina glauca</i>	35	12	4		Retain		
008	Muttonwood	<i>Rapanea variabilis</i>	28	8	4		Remove		
009	Acacia	<i>Acacia sp.</i>	27	7	5		Retain		Two stems
010	Acacia	<i>Acacia sp.</i>	28	6	4		Retain		Several stems
011	Grey ironbark	<i>Eucalyptus siderophloia</i>	42	19	10		Remove		
012	Grey ironbark	<i>Eucalyptus siderophloia</i>	20	10	3		Remove		
013	Swamp oak	<i>Casuarina glauca</i>	19	15	1		Remove		
014	Swamp oak	<i>Casuarina glauca</i>	19	17	2		Remove		
015	Swamp oak	<i>Casuarina glauca</i>	25	17	2		Remove		
016	Swamp oak	<i>Casuarina glauca</i>	17	15	3		Remove		
017	Swamp oak	<i>Casuarina glauca</i>	15	14	4		Remove		
018	Swamp oak	<i>Casuarina glauca</i>	20	18	3		Remove		
019	Swamp oak	<i>Casuarina glauca</i>	19	16	2		Remove		
020	Swamp oak	<i>Casuarina glauca</i>	23	16	2		Remove		
021	Swamp oak	<i>Casuarina glauca</i>	21	15	4		Remove		

Vegetation Management Plan - MIBA Bulk Earthworks, NEBP

Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
022	Grey ironbark	<i>Eucalyptus siderophloia</i>	23	16	4		Remove		
023	Swamp oak	<i>Casuarina glauca</i>	26	19	3		Remove		
024	Swamp oak	<i>Casuarina glauca</i>	34	18	4		Remove		
025	Swamp oak	<i>Casuarina glauca</i>	15	11	2		Remove		
026	Swamp oak	<i>Casuarina glauca</i>	17	13	3		Remove		
027	Swamp oak	<i>Casuarina glauca</i>	19	13	3		Remove		
028	Swamp oak	<i>Casuarina glauca</i>	17	14	4		Remove		
029	Swamp oak	<i>Casuarina glauca</i>	27	15	5		Remove		
030	Swamp oak	<i>Casuarina glauca</i>	28	16	3		Remove		
031	Swamp oak	<i>Casuarina glauca</i>	15	10	1		Remove		
032	Swamp oak	<i>Casuarina glauca</i>	26	18	4		Remove		
033	Swamp oak	<i>Casuarina glauca</i>	16	14	2		Remove		
034	Swamp oak	<i>Casuarina glauca</i>	15	15	1		Remove		
035	Swamp oak	<i>Casuarina glauca</i>	16	15	2		Remove		
036	Grey mangrove	<i>Avicennia marina</i>	35	11	8		Remove		
037	Grey mangrove	<i>Avicennia marina</i>	16	11	3		Remove		
038	Grey mangrove	<i>Avicennia marina</i>	16	6	7		Remove		
039	Swamp oak	<i>Casuarina glauca</i>	15	12	5		Remove		
040	Grey mangrove	<i>Avicennia marina</i>	30	7	5		Remove		
041	Swamp oak	<i>Casuarina glauca</i>	29	10	5		Remove		
042	Grey mangrove	<i>Avicennia marina</i>	50	8	10		Remove		
043	Swamp oak	<i>Casuarina glauca</i>	15	17	3		Remove		
044	Swamp oak	<i>Casuarina glauca</i>	21	15	4		Remove		
045	Swamp oak	<i>Casuarina glauca</i>	16	16	3		Remove		
046	Grey mangrove	<i>Avicennia marina</i>	30	15	10		Remove		
047	Grey mangrove	<i>Avicennia marina</i>	60	15	13		Remove		

Vegetation Management Plan - MIBA Bulk Earthworks, NEBP

Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
048	Grey mangrove	<i>Avicennia marina</i>	50	15	13		Remove		2 stems
049	Grey mangrove	<i>Avicennia marina</i>	45	14	12		Remove		
050	Grey mangrove	<i>Avicennia marina</i>	20	13	10		Remove		
051	Grey mangrove	<i>Avicennia marina</i>	30	14	9		Remove		
052	Swamp oak	<i>Casuarina glauca</i>	23	15	3		Remove		
053	Swamp oak	<i>Casuarina glauca</i>	15	15	3		Remove		
054	Swamp oak	<i>Casuarina glauca</i>	16	16	2		Remove		
055	Swamp oak	<i>Casuarina glauca</i>	17	17	2		Remove		
056	Swamp oak	<i>Casuarina glauca</i>	15	17	3		Remove		
057	Swamp oak	<i>Casuarina glauca</i>	15	14	5		Remove		
058	Swamp oak	<i>Casuarina glauca</i>	15	14	3		Remove		
059	Swamp oak	<i>Casuarina glauca</i>	20+16+2 2	13	5		Remove		
060	Swamp oak	<i>Casuarina glauca</i>	19+9	16	3		Remove		
061	Swamp oak	<i>Casuarina glauca</i>	17	15	3		Remove		
062	Swamp oak	<i>Casuarina glauca</i>	16	15	2		Remove		
063	Swamp oak	<i>Casuarina glauca</i>	19	15	2		Remove		
064	Swamp oak	<i>Casuarina glauca</i>	17	13	4		Remove		
065	Swamp oak	<i>Casuarina glauca</i>	18	15	2		Remove		
066	Swamp oak	<i>Casuarina glauca</i>	23	18	3		Remove		
067	Swamp oak	<i>Casuarina glauca</i>	19	17	2		Remove		
068	Swamp oak	<i>Casuarina glauca</i>	26	17	4		Remove		
069	Swamp oak	<i>Casuarina glauca</i>	20	16	3		Remove		
070	Grey mangrove	<i>Avicennia marina</i>	35+40	12	12		Remove		
071	Grey mangrove	<i>Avicennia marina</i>	30	8	14		Remove		
072	Grey ironbark	<i>Eucalyptus siderophloia</i>	30	18	6		Remove		

Vegetation Management Plan - MIBA Bulk Earthworks, NEBP

Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
073	Grey ironbark	<i>Eucalyptus siderophloia</i>	29	18	8		Remove		
074	Grey ironbark	<i>Eucalyptus siderophloia</i>	29	19	8		Remove		
075	Grey ironbark	<i>Eucalyptus siderophloia</i>	15	17	4		Remove		
076	Grey ironbark	<i>Eucalyptus siderophloia</i>	30	17	4		Remove		
077	Grey ironbark	<i>Eucalyptus siderophloia</i>	22	15	4		Remove		
078	Grey ironbark	<i>Eucalyptus siderophloia</i>	16	14	3		Remove		
079	Grey ironbark	<i>Eucalyptus siderophloia</i>	60	23	10		Remove		
080	Grey ironbark	<i>Eucalyptus siderophloia</i>	34	19	7		Remove		
081	Grey ironbark	<i>Eucalyptus siderophloia</i>	28	23	3		Remove		
082	Grey ironbark	<i>Eucalyptus siderophloia</i>	29	23	10		Remove		
083	Grey mangrove	<i>Avicennia marina</i>	31+26	12	10		Remove		
084	Grey ironbark	<i>Eucalyptus siderophloia</i>	65	23	14		Remove		
085	Swamp oak	<i>Casuarina glauca</i>	20	11	3		Remove		
086	Grey mangrove	<i>Avicennia marina</i>	25	8	5		Remove		
087	Swamp oak	<i>Casuarina glauca</i>	28	10	4		Remove		
088	Swamp oak	<i>Casuarina glauca</i>	25	5	4		Remove		
089	Grey mangrove	<i>Avicennia marina</i>	29	8	9		Remove		2 stems
090	Swamp oak	<i>Casuarina glauca</i>	27	15	6		Remove		

Vegetation Management Plan - MIBA Bulk Earthworks, NEBP

Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
091	Grey mangrove	<i>Avicennia marina</i>	27	10	6		Remove		
092	Grey mangrove	<i>Avicennia marina</i>	18	10	9		Remove		Multiple stems
093	Grey mangrove	<i>Avicennia marina</i>	32	10	9		Remove		
094	Swamp oak	<i>Casuarina glauca</i>	16	11	2		Remove		
095	Swamp oak	<i>Casuarina glauca</i>	18	12	3		Remove		
096	Swamp oak	<i>Casuarina glauca</i>	21	9	3		Remove		
097	Grey mangrove	<i>Avicennia marina</i>	55	9	7		Remove		Multi stems
098	Swamp oak	<i>Casuarina glauca</i>	18	11	3		Remove		
099	Swamp oak	<i>Casuarina glauca</i>	22	14	2		Remove		
100	Swamp oak	<i>Casuarina glauca</i>	15	11	3		Remove		
101	Grey ironbark	<i>Eucalyptus siderophloia</i>	60	20	11		Retain		
102	Blue gum	<i>Eucalyptus tereticornis</i>	55	24	7		Remove		
103	Blue gum	<i>Eucalyptus tereticornis</i>	60	24	8		Remove		
104	Blue gum	<i>Eucalyptus tereticornis</i>	40	23	10		Remove		
105	Blue gum	<i>Eucalyptus tereticornis</i>	70	26	9		Remove		
106	Blue gum	<i>Eucalyptus tereticornis</i>	95	25	10		Remove		
107	Blue gum	<i>Eucalyptus tereticornis</i>	70	26	10		Remove		
108	Blue gum	<i>Eucalyptus tereticornis</i>	80	27	12		Retain		

Vegetation Management Plan - MIBA Bulk Earthworks, NEBP

Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/ Retain	Habitat Features	Notes
109	Blue gum	<i>Eucalyptus tereticornis</i>	32	16	7		Retain		
110	Blue gum	<i>Eucalyptus tereticornis</i>	35	20	6		Remove		
111	Blue gum	<i>Eucalyptus tereticornis</i>	28	17	8		Remove		
112	Blue gum	<i>Eucalyptus tereticornis</i>	50	19	5		Retain		
113	Blue gum	<i>Eucalyptus tereticornis</i>	40	21	7		Retain		
114	Blue gum	<i>Eucalyptus tereticornis</i>	38	14	5		Retain		
115	Blue gum	<i>Eucalyptus tereticornis</i>	36	16			Retain		
116	Blue gum	<i>Eucalyptus tereticornis</i>	65	18	6		Remove		
117	Blue gum	<i>Eucalyptus tereticornis</i>	25	13	3		Remove		
118	Blue gum	<i>Eucalyptus tereticornis</i>	90	21	9		Remove		
119	Blue gum	<i>Eucalyptus tereticornis</i>	42	13	7		Retain		
120	Blue gum	<i>Eucalyptus tereticornis</i>	45	21	6		Retain		
121	Blue gum	<i>Eucalyptus tereticornis</i>	58	18	8		Retain		
122	Moreton Bay fig	<i>Ficus macrophylla</i>	30	10	5		Retain		
123	Blue gum	<i>Eucalyptus tereticornis</i>	55	22	8		Retain		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/ Retain	Habitat Features	Notes
124	Blue gum	<i>Eucalyptus tereticornis</i>	38	18	6		Retain		
125	Blue gum	<i>Eucalyptus tereticornis</i>	60	19	7		Retain		
126	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	25	13	4		Retain		
127	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	25	10	2		Retain		
128	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	30	10	4		Retain		
129	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	26	10	2		Retain		
130	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	24	10	3		Retain		2 stems
131	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	30	9	4		Retain		
132	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	37	10	5		Retain		
133	Blue gum	<i>Eucalyptus tereticornis</i>	45	18	7		Retain		
134	Swamp oak	<i>Casuarina glauca</i>	28	10	3		Retain		
135	Blue gum	<i>Eucalyptus tereticornis</i>	35	15	6		Retain		
136	Blue gum	<i>Eucalyptus tereticornis</i>	35	19	8		Retain		
137	Swamp oak	<i>Casuarina glauca</i>	26+16+2 8+25	16	5		Retain		
138	Blue gum	<i>Eucalyptus tereticornis</i>	95	20	10		Retain		
139	Swamp oak	<i>Casuarina glauca</i>	14	13	4		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
140	Swamp oak	<i>Casuarina glauca</i>	28	13	3		Retain		
141	Swamp oak	<i>Casuarina glauca</i>	16	11	3		Retain		
142	Blue gum	<i>Eucalyptus tereticornis</i>	35	18	4		Remove		
143	Swamp oak	<i>Casuarina glauca</i>	35	19	6		Remove		
144	Swamp oak	<i>Casuarina glauca</i>	18	10	4		Remove		
145	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	28	8	3		Remove		
146	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	20+15+10	8	1		Remove		
147	Swamp oak	<i>Casuarina glauca</i>	27	8	3		Remove		
148	Blue gum	<i>Eucalyptus tereticornis</i>	27	10	3		Retain		
149	Moreton Bay fig	<i>Ficus macrophylla</i>	100	22	22		Retain		
150	Moreton Bay fig	<i>Ficus macrophylla</i>	100	22	22		Retain		
151	Moreton Bay fig	<i>Ficus macrophylla</i>	120	22	20		Retain		
152	Moreton Bay fig	<i>Ficus macrophylla</i>	120	21	12		Retain		
153	Kamala	<i>Mallotus philippensis</i>	20	8	3		Remove		
154	Grey ironbark	<i>Eucalyptus siderophloia</i>	25	10	3		Remove		
155	Blue gum	<i>Eucalyptus tereticornis</i>	58	15	9		Retain		
156	Blue gum	<i>Eucalyptus tereticornis</i>	100	17	9		Remove		
157	Blue gum	<i>Eucalyptus tereticornis</i>	60	18	7		Retain		
158	Blue gum	<i>Eucalyptus tereticornis</i>	36	18	5		Retain		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
159	Tuckeroo	<i>Cupaniopsis anacardioides</i>	17	6	2		Retain		
160	Blue gum	<i>Eucalyptus tereticornis</i>	58	18	6		Retain		
161	Swamp oak	<i>Casuarina glauca</i>	16	9			Retain		
162	Swamp oak	<i>Casuarina glauca</i>	21	9	3		Retain		
163	Blue gum	<i>Eucalyptus tereticornis</i>	34	14	5		Retain		
164	Blue gum	<i>Eucalyptus tereticornis</i>	65	18	7		Retain		
165	Blue gum	<i>Eucalyptus tereticornis</i>	30	14	5		Remove		
166	Blue gum	<i>Eucalyptus tereticornis</i>	75	19	10		Remove		
167	Blue gum	<i>Eucalyptus tereticornis</i>	35	17	6		Remove		
168	Blue gum	<i>Eucalyptus tereticornis</i>	29	14	4		Remove		
169	Blue gum	<i>Eucalyptus tereticornis</i>	30	15	6		Remove		
170	Red ash	<i>Alphitonia excelsa</i>	26	8	3		Remove		
171	Red ash	<i>Alphitonia excelsa</i>	17	5	5		Remove		
172	Blue gum	<i>Eucalyptus tereticornis</i>	23	7	2		Remove		
173	Acacia	<i>Acacia sp.</i>	17	6	2		Remove		
174	Tuckeroo	<i>Cupaniopsis anacardioides</i>	25	5	3		Remove		
175	Acacia	<i>Acacia sp.</i>	28	5	4		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
176	Tuckeroo	<i>Cupaniopsis anacardioides</i>	27	5	3		Remove		
177	Grey ironbark	<i>Eucalyptus siderophloia</i>	55	21	8		Remove		
178	Blue gum	<i>Eucalyptus tereticornis</i>	55	21	10		Remove		
179	Blue gum	<i>Eucalyptus tereticornis</i>	35	18	4		Remove		
180	Rough-leaved elm	<i>Aphananthe philippinensis</i>	40	10	6		Retain		
181	Dead	<i>Dead</i>	80	8	0	Yes	Remove	Hollows. Very rotten	
182	Blue gum	<i>Eucalyptus tereticornis</i>	50	17	6		Retain		
183	Blue gum	<i>Eucalyptus tereticornis</i>	60	25	12		Retain		
184	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	30+29++ 28+	11	6		Retain		
185	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	60	12	6		Retain		
186	Grey ironbark	<i>Eucalyptus siderophloia</i>	45	25	6		Retain		
187	Grey ironbark	<i>Eucalyptus siderophloia</i>	40	19	5		Retain		
188	Grey ironbark	<i>Eucalyptus siderophloia</i>	55	23	7		Retain		
189	Blue gum	<i>Eucalyptus tereticornis</i>	34	14	4		Remove		
190	Blue gum	<i>Eucalyptus tereticornis</i>	60	16	7		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
191	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	38	15	6		Remove		
192	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	42	15	6		Remove		
193	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	58	18	8		Remove		
194	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	38	15	6		Remove		
195	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	39	16	6		Remove		
196	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	34	16	5		Remove		
197	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	60	16	6		Remove		
198	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	48	14	9		Remove		
199	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	65	15	9		Remove		
200	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	38	13	5		Remove		
201	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	42	16	7		Remove		
202	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	28	16	6		Remove		
203	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	21	12	4		Remove		
204	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	34	16	8		Remove		
205	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	18	14	4		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
206	Blue gum	<i>Eucalyptus tereticornis</i>	48	22	6		Remove		
207	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	12		1		Remove		
208	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	16	14	6		Remove		
209	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	38	16	7		Remove		
210	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	28	16	4		Remove		
211	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	36	20	5		Remove		
212	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	50	21	6		Remove		
213	Pink bloodwood	<i>Corymbia intermedia</i>	35	19	8		Remove		
214	Swamp box	<i>Lophostemon suaveolens</i>	48	12	6		Remove		
215	Grey ironbark	<i>Eucalyptus siderophloia</i>	58	24	11		Remove		
216	Pink bloodwood	<i>Corymbia intermedia</i>	22	15	6		Remove		
217	Pink bloodwood	<i>Corymbia intermedia</i>	22	22	7		Remove		
218	Swamp box	<i>Lophostemon suaveolens</i>	33	17	6		Remove		
219	Swamp box	<i>Lophostemon suaveolens</i>	30	17	4		Remove		
220	Swamp box	<i>Lophostemon suaveolens</i>	29	10	9		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
221	Pink bloodwood	<i>Corymbia intermedia</i>	35	23	9		Remove		
222	Pink bloodwood	<i>Corymbia intermedia</i>	50	27	10		Remove		
223	Grey ironbark	<i>Eucalyptus siderophloia</i>	64	28	10		Remove		
224	Dead	<i>Dead</i>	28	12	0		Remove		
225	Pink bloodwood	<i>Corymbia intermedia</i>	43	28	8		Remove		
226	Swamp box	<i>Lophostemon suaveolens</i>	21	11	5		Remove		
227	Rusty gum	<i>Angophora leiocarpa</i>	48	26	9		Remove		
228	Swamp box	<i>Lophostemon suaveolens</i>	24	14	6		Remove		
229	Pink bloodwood	<i>Corymbia intermedia</i>	13	10	4		Remove		
230	Swamp box	<i>Lophostemon suaveolens</i>	20	13	4		Remove		
231	Swamp box	<i>Lophostemon suaveolens</i>	19	15	4		Remove		
232	Swamp box	<i>Lophostemon suaveolens</i>	24	14	5		Remove		
233	Swamp box	<i>Lophostemon suaveolens</i>	19	16	3		Remove		
234	Pink bloodwood	<i>Corymbia intermedia</i>	27	20	7		Remove		
235	Broad-leaved white mahogany	<i>Eucalyptus carnea</i>	31	15	7		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
236	Grey ironbark	<i>Eucalyptus siderophloia</i>	31	22	10		Remove		
237	Swamp box	<i>Lophostemon suaveolens</i>	30	12	3	Yes	Remove		Hollow
238	Pink bloodwood	<i>Corymbia intermedia</i>	63	22	10	Yes	Remove	Termite mound and potential hollows	
239	Swamp box	<i>Lophostemon suaveolens</i>	25	12	7		Remove		
240	Grey ironbark	<i>Eucalyptus siderophloia</i>	62	27	12		Remove		
241	Swamp box	<i>Lophostemon suaveolens</i>	20	17	6		Remove		
242	Swamp box	<i>Lophostemon suaveolens</i>	38	16	6		Remove		
243	Pink bloodwood	<i>Corymbia intermedia</i>	30	20	8		Remove		
244	Grey ironbark	<i>Eucalyptus siderophloia</i>	40	24	12		Remove		
245	Dead	<i>Dead</i>	26	5	0	Yes	Remove		
246	Pink bloodwood	<i>Corymbia intermedia</i>	26+27	14	8		Remove		
247	Swamp box	<i>Lophostemon suaveolens</i>	35+12	12	5		Remove		
248	Swamp box	<i>Lophostemon suaveolens</i>	23	5	3		Remove		
249	Swamp box	<i>Lophostemon suaveolens</i>	30	14	4		Remove		
250	Dead	<i>Dead</i>	23	10	0	Yes	Remove		
251	Pink bloodwood	<i>Corymbia intermedia</i>	18+17+1 7	14	9		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
252	Blue gum	<i>Eucalyptus tereticornis</i>	100	26	15	Yes	Remove		
253	Swamp box	<i>Lophostemon suaveolens</i>	21	12	3		Remove		
254	Swamp box	<i>Lophostemon suaveolens</i>	21	11	4		Remove		
255	Swamp box	<i>Lophostemon suaveolens</i>	20	12	4		Remove		
256	Swamp box	<i>Lophostemon suaveolens</i>	24	15	3		Remove		
257	Swamp box	<i>Lophostemon suaveolens</i>	23	15	5		Remove		
258	Swamp box	<i>Lophostemon suaveolens</i>	18	15	3		Remove		
259	Swamp box	<i>Lophostemon suaveolens</i>	10	8	2		Remove		
260	Swamp box	<i>Lophostemon suaveolens</i>	20	16	6		Remove		
261	Pink bloodwood	<i>Corymbia intermedia</i>	27	16	7		Remove		
262	Swamp box	<i>Lophostemon suaveolens</i>	19	17	5		Remove		
263	Swamp box	<i>Lophostemon suaveolens</i>	17	9	2		Remove		
264	Pink bloodwood	<i>Corymbia intermedia</i>	28	23	10		Remove		
265	Swamp box	<i>Lophostemon suaveolens</i>	18	14	7		Remove		
266	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	48	20	10		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
267	Dead	<i>Dead</i>	80	20	0	Yes	Remove		
268	Blue gum	<i>Eucalyptus tereticornis</i>	13	12	3		Remove		
269	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	45	19	5		Remove		
270	Pink bloodwood	<i>Corymbia intermedia</i>	31+28+1 9	23	7		Remove		
271	Swamp box	<i>Lophostemon suaveolens</i>	18	17	4		Remove		
272	Swamp box	<i>Lophostemon suaveolens</i>	29	16	6		Remove		
273	Swamp box	<i>Lophostemon suaveolens</i>	19	18	7		Remove		
274	Grey ironbark	<i>Eucalyptus siderophloia</i>	60	32	17		Remove		
275	Swamp box	<i>Lophostemon suaveolens</i>	42	6	4	Yes	Remove	Hollow	
276	Pink bloodwood	<i>Corymbia intermedia</i>	43	22	6		Remove		
277	Grey ironbark	<i>Eucalyptus siderophloia</i>	48	29	13	Yes	Remove	Hollow	
278	Dead	<i>Dead</i>	15	9	3		Remove		
279	Pink bloodwood	<i>Corymbia intermedia</i>	30	23	11		Remove		
280	Dead	<i>Dead</i>	36	15	4	Yes	Remove	Hollows	
281	Pink bloodwood	<i>Corymbia intermedia</i>	26	18	7		Remove		
282	Swamp box	<i>Lophostemon suaveolens</i>	26	14	5		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
283	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	29	15	5		Remove		
284	Swamp box	<i>Lophostemon suaveolens</i>	28	9	4		Remove		
285	Blue gum	<i>Eucalyptus tereticornis</i>	90	30	15	Yes	Remove	Potential hollows	
286	Grey ironbark	<i>Eucalyptus siderophloia</i>	50	20	12		Remove		
287	Dead	<i>Dead</i>	70	16	3	Yes	Remove		
288	Dead	<i>Dead</i>	80	20	3	Yes	Remove	Hollows	
289	Blue gum	<i>Eucalyptus tereticornis</i>	75	26	12		Remove		
290	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	16+17	14	4		Remove		
291	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	23	17	4		Remove		
292	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	29	20	6		Remove		
293	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	50+33	20	7		Remove		
294	Dead	<i>Dead</i>	40	17	0	Yes	Remove	Hollows	
295	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	48	19	7		Remove		
296	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	29	19	4		Remove		
297	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	29	17	4		Remove		
298	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	29	17	3		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/ Retain	Habitat Features	Notes
299	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	59	18	10	Yes	Remove	Potential hollows	
300	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	46	21	7		Remove		
301	Swamp box	<i>Lophostemon suaveolens</i>	22	16	7		Remove		
302	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	48	17	8		Remove		
303	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	27	19	5		Remove		
304	Swamp box	<i>Lophostemon suaveolens</i>	19	20	5		Remove		
305	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	19	18	5		Remove		
306	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	18+14	15	5		Remove		
307	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	28+22	17	7		Remove		
308	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	28	19	5		Remove		
309	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	26	17	6		Remove		
310	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	27	16	7		Remove		
311	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	58	18	9		Remove		
312	Pink bloodwood	<i>Corymbia intermedia</i>	38	19	6	Yes	Remove	Nest	
313	Blue gum	<i>Eucalyptus tereticornis</i>	70	27	13	Yes	Remove	Potential hollows	

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
314	Swamp box	<i>Lophostemon suaveolens</i>	40	18	5		Remove		
315	Swamp box	<i>Lophostemon suaveolens</i>	23	16	3		Remove		
316	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	36	14	5		Remove		
317	Swamp box	<i>Lophostemon suaveolens</i>	29	16	7		Remove		
318	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	55+50	19	12		Remove		
319	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	38	19	11		Remove		
320	Swamp box	<i>Lophostemon suaveolens</i>	25	18	4		Remove		
321	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	47	21	5		Remove		
322	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	40	22	6		Remove		
323	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	48	19	10		Remove		
324	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	37	14	4		Remove		
325	Blue gum	<i>Eucalyptus tereticornis</i>	55	24	9		Remove		
326	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	40	15	9		Remove		
327	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	45+30	18	9		Remove		
328	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	55	18	10		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/ Retain	Habitat Features	Notes
329	Blue gum	<i>Eucalyptus tereticornis</i>	35+35	21	7		Remove		
330	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	31	12	10		Remove		
331	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	42	18	5		Remove		
332	Swamp box	<i>Lophostemon suaveolens</i>	20	14	3		Remove		
333	Blue gum	<i>Eucalyptus tereticornis</i>	58	25	10		Remove		
334	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	37	14	8		Remove		
335	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	40	14	8		Remove		
336	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	38	18	7		Remove		
337	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	50	17	8		Remove		
338	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	48	19	5		Remove		
339	Blue gum	<i>Eucalyptus tereticornis</i>	49	22	8		Remove		
340	Grey ironbark	<i>Eucalyptus siderophloia</i>	27	22	4		Remove		
341	Pink bloodwood	<i>Corymbia intermedia</i>	26	15	4		Remove		
342	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	55	17	9		Remove		
343	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	35	17	5		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
344	Blue gum	<i>Eucalyptus tereticornis</i>	47	25	11	Yes	Remove	Potential hollows	
345	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	28	12	4		Remove		
346	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	37	12	9		Remove		
347	Grey ironbark	<i>Eucalyptus siderophloia</i>	39	22	8		Remove		
348	Grey ironbark	<i>Eucalyptus siderophloia</i>	54	22	6	Yes	Remove	Potential hollows	
349	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	30	6	6		Remove		
350	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	28	13	5		Remove		
351	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	40	13	6		Remove		
352	Pink bloodwood	<i>Corymbia intermedia</i>	28	13	8		Remove		
353	Rusty gum	<i>Angophora leiocarpa</i>	19	12	4		Remove		
354	Pink bloodwood	<i>Corymbia intermedia</i>	29	17	6		Remove		
355	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	36	17	7		Remove		
356	Pink bloodwood	<i>Corymbia intermedia</i>	28	20	8		Remove		
357	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	38	22	7		Remove		
358	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	30	9	10		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/ Retain	Habitat Features	Notes
359	Grey ironbark	<i>Eucalyptus siderophloia</i>	52	20	9		Remove		
360	Swamp box	<i>Lophostemon suaveolens</i>	47	18	4		Remove		
361	Grey ironbark	<i>Eucalyptus siderophloia</i>	72	30	15		Remove		
362	Pink bloodwood	<i>Corymbia intermedia</i>	29	22	6		Retain		
363	Pink bloodwood	<i>Corymbia intermedia</i>	28	20	6		Retain		
364	Scribbly gum	<i>Eucalyptus racemosa</i>	100	29	10	Yes	Retain	Hollows	
365	Scribbly gum	<i>Eucalyptus racemosa</i>	85	25	9	Yes	Retain	Hollows	
366	Pink bloodwood	<i>Corymbia intermedia</i>	35	23	8		Remove		
367	Blue gum	<i>Eucalyptus tereticornis</i>	85	26	11	Yes	Retain	Hollows	
368	Blue gum	<i>Eucalyptus tereticornis</i>	55	25	9	Yes	Retain	Hollows	
369	Blue gum	<i>Eucalyptus tereticornis</i>	70	25	10	Yes	Retain	Hollows	
370	Blue gum	<i>Eucalyptus tereticornis</i>	50	24	9	Yes	Retain		
371	Pink bloodwood	<i>Corymbia intermedia</i>	45	24	7		Retain		
372	Blue gum	<i>Eucalyptus tereticornis</i>	40	21	11		Retain		
373	Blue gum	<i>Eucalyptus tereticornis</i>	35	20	7		Retain		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/ Retain	Habitat Features	Notes
374	Blue gum	<i>Eucalyptus tereticornis</i>	60	19	7		Retain		
375	Blue gum	<i>Eucalyptus tereticornis</i>	75	22	9	Yes	Retain	Hollows	
376	Blue gum	<i>Eucalyptus tereticornis</i>	60	22	9	Yes	Retain	Hollows	
377	Pink bloodwood	<i>Corymbia intermedia</i>	50	24	10		Retain		
378	Pink bloodwood	<i>Corymbia intermedia</i>	40	23	8	Yes	Retain	Termite mound	
379	Grey ironbark	<i>Eucalyptus siderophloia</i>	50	28	10		Retain		
380	Blue gum	<i>Eucalyptus tereticornis</i>	90	30	14	Yes	Retain	Hollows - lots	
381	Scribbly gum	<i>Eucalyptus racemosa</i>	55	20	6	Yes	Retain	Potential hollows	
382	Pink bloodwood	<i>Corymbia intermedia</i>	45	23	12		Retain		
383	Pink bloodwood	<i>Corymbia intermedia</i>	40	22	10	Yes	Retain	Nest box	
384	Scribbly gum	<i>Eucalyptus racemosa</i>	45	21	12		Retain		
385	Pink bloodwood	<i>Corymbia intermedia</i>	45	30	12	Yes	Retain	Hollows	
386	Blue gum	<i>Eucalyptus tereticornis</i>	40	24	12		Retain		
387	Blue gum	<i>Eucalyptus tereticornis</i>	30	20	7		Retain		
388	Scribbly gum	<i>Eucalyptus racemosa</i>	65	22	8	Yes	Retain	Hollows	

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
389	Grey ironbark	<i>Eucalyptus siderophloia</i>	40	27	10		Retain		
390	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	25	24	5		Retain		
391	Scribbly gum	<i>Eucalyptus racemosa</i>	70	22	9	Yes	Retain	Hollows	
392	Blue gum	<i>Eucalyptus tereticornis</i>	40+55	20	10		Remove		
393	Blue gum	<i>Eucalyptus tereticornis</i>	55	24	9		Remove		
394	Blue gum	<i>Eucalyptus tereticornis</i>	22	10	3		Remove		
395	Blue gum	<i>Eucalyptus tereticornis</i>	18	10	2		Remove		
396	Blue gum	<i>Eucalyptus tereticornis</i>	38+28	23	10	Yes	Remove	Hollow	
397	Blue gum	<i>Eucalyptus tereticornis</i>	39	21	9		Remove		
398	Blue gum	<i>Eucalyptus tereticornis</i>	38	16	9		Remove		
399	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	20	14	4		Remove		
400	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	20	14	4		Remove		
401	Blue gum	<i>Eucalyptus tereticornis</i>	16	9	2		Remove		
402	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	15*8 stems	9	3		Remove		
403	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	20	9	2		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
404	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	20*5stem	10	4		Remove		
405	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	16*4stem	6	3		Remove		
406	Swamp box	<i>Lophostemon suaveolens</i>	10	4	1		Remove		
407	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	15*8stem	6	3		Remove		
408	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	20*3stem	9	3		Remove		
409	Blue gum	<i>Eucalyptus tereticornis</i>	48	20	7		Remove		
410	Blue gum	<i>Eucalyptus tereticornis</i>	50	25	9		Remove		
411	Blue gum	<i>Eucalyptus tereticornis</i>	45	14	4		Remove		
412	Blue gum	<i>Eucalyptus tereticornis</i>	58	25	12		Remove		
413	Pink bloodwood	<i>Corymbia intermedia</i>	45	25	8		Remove		
414	Blue gum	<i>Eucalyptus tereticornis</i>	42	10	2		Remove		
415	Blue gum	<i>Eucalyptus tereticornis</i>	20	17	5		Remove		
416	Grey ironbark	<i>Eucalyptus siderophloia</i>	30	20	8		Remove		
417	Grey ironbark	<i>Eucalyptus siderophloia</i>	30	20	8		Remove		
418	Blue gum	<i>Eucalyptus tereticornis</i>	16	10	2		Remove		

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Tree ID	Common Name	Tree Species	DBH (cm)	Height (m)	Canopy Spread (m)	Habitat Tree	Remove/Retain	Habitat Features	Notes
419	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	30	10	4		Remove		

