WESTERN ENVIRONMENTAL

88 Mill Point Road, South Perth

Acid Sulfate Soil and Dewatering Management Plan

Western Environmental Pty Ltd
(08) 6162 8980
PO Box 437, Leederville, WA 6903
enquiries@westenv.com.au
westenv.com.au

88 Mill Point Road, South Perth

Acid Sulfate Soil and Dewatering Management Plan

Report No:
P20.227-RPT-ASSDMP_0
Issue Date:
18-Dec-2020
Status
FINAL

Prepared for:
CMW Geosciences
Suite 1, Level 3/29 Flynn St
WEMBLEY WA 6014

Prepared by
Western Environmental Pty Ltd
Level 3, 25 Prowse Street
West Perth WA 600
www.westenv.com.au

Internal Review

Author	Reviewed by	Approved by
		
Leah Petrie Environmental Scientist	**Philip Brand** Associate Environmental Scientist	**Philip Brand** Associate Environmental Scientist
17-Dec-2020	**18-Dec-2020**	**18-Dec-2020**

Distribution Record

Copies	Document ID / Version	Date	Received by
1 (E)	P20.227-RPT-SDMP_A / PRELIMINARY	17-Dec-2020	CMW Geosciences
1 (E)	P20.227-RPT-ASSDMP_0 / FINAL	18-Dec-2020	CMW Geosciences

Statement of Limitations

Copyright Statement

Scope of Services

This environmental report ("this report") has been prepared for the sole benefit and exclusive use of the Client for the purpose for which it was prepared in accordance with the agreement between the Client and Western Environmental Pty Ltd ("the Agreement"). Western Environmental Pty Ltd (WEPL) disclaims any and all liability with respect to any use of or reliance upon this report for any other purpose whatsoever.

In particular, it should be noted that this report is based on a scope of services defined by the Client, and is limited by budgetary and time constraints, the information supplied by the Client (and its agents) and, in some circumstances, access and/or site disturbance constraints.

The scope of services did not include any assessment of the title to or ownership of the properties, buildings and structures referred to in this report, or the application or interpretation of laws in the jurisdiction in which those properties, buildings and structures are located.

Reliance on Data

In preparing this report, WEPL has relied on data, surveys, analyses, designs, plans and other information provided by the Client (or its agents), other individuals and organisations ("the data"). Except as otherwise stated in this report, WEPL has not verified the accuracy or completeness of the data. WEPL does not represent or warrant that the data is true or accurate, and disclaims any and all responsibility or liability with respect to the use of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in this report ("conclusions") are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. WEPL does not accept any responsibility or liability for any incorrect or inaccurate conclusions should any data be incorrect, inaccurate or incomplete or have been concealed, withheld, misrepresented or otherwise not fully disclosed to WEPL.

The conclusions must also be considered in light of the agreed scope of services (including any constraints or limitation therein) and the methods used to carry out those services, both of which are as stated or referred to in this report.

Environmental Conclusions

In accordance with the scope of services, WEPL has conducted environmental field monitoring and/or testing in the preparation of this report. The nature and extent of monitoring and/or testing conducted is described in this report.

On all sites, varying degrees of non-uniformity of the vertical and horizontal soil or groundwater conditions are encountered. Hence no monitoring, common testing or sampling technique can eliminate the possibility that monitoring or testing results/samples are not totally representative of soil and/or groundwater conditions encountered. The conclusions are based on the data and the environmental field monitoring and/or testing actually undertaken, and are therefore merely indicative of the environmental condition of the site at the time of preparing this report, including the presence or otherwise of contaminants or emissions. It should be recognised that site conditions, including the extent and concentration of contaminants, can change.

Within the limitations imposed by the scope of services, the monitoring, testing, sampling and preparation of this report have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. To the maximum extent permitted by law, no other warranty, express or implied, is made.

Report for Benefit of Client

This report is confidential. Neither the whole nor any part of this report, or any copy or extract thereof, may be disclosed or otherwise made available to any third party without the prior written approval of WEPL.

WEPL accepts no liability or responsibility whatsoever in respect of any use of or reliance upon this report, by any person or organisation who is not a party to the Agreement. Reliance on this report by any person who is not a party to the Agreement is expressly prohibited. Any representation in this report is made only to the parties to the Agreement.

WEPL assumes no responsibility and disclaims any and all liability to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in this report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in this report (including without limitation matters arising from any negligent act or omission of WEPL or for any loss or damage suffered by any other party using or relying on the matters dealt with or conclusions expressed in this report, even if WEPL has been advised of the possibility of such use or reliance).

Other parties should not rely on this report or the accuracy or completeness of any conclusions contained in this report, and should make their own enquiries and obtain independent advice in relation to such matters.

If an Auditor is engaged by the Client to undertake review of this report, it shall be made available subject to the terms and conditions of the agreement between the Client and WEPL and the caveats in this statement.

Other Limitations

This report is intended to be read in its entirety, and sections or parts of this report should therefore not be read and relied on out of context.

WEPL will not be liable to update or revise this report to take into account any events or circumstances or facts becoming apparent after the date of this report.

Executive Summary

Introduction

Western Environmental Pty Ltd (WEPL) was commissioned by CMW Geosciences (the Client) to undertake a contamination and Acid Sulfate Soil (ASS) investigation and prepare an ASS and Dewatering Management Plan (ASSDMP) for 88 Mill Point Road, South Perth (the Site). The Site is located approximately 2 km south of the CBD (Figure 1). The Site is comprised of the following cadastral lots:

- Lot 2 on Plan D000812 - 86 Mill Point Road
- Lot 15 on Plan D018674 - 88 Mill Point Road
- Lot 16 on Plan D018674 - 90 Mill Point Road.

This report documents the investigative works undertaken at the Site and includes a soil and dewatering management plan, prepared in compliance with current DWER guidelines. Note that at the time of this report, WEPL had only received 50% of the confirmatory ASS testing results for the Site; this management plan should be revised in the event that the final data set suggests that additional management is required in accordance with the ASS management guidelines (DER, 2015b).

Objectives

The objectives of the ASSDMP are as follows:

- To undertake an ASS investigation report for the site, that is consistent with the current ASS investigation guidelines (DER, 2015a).
- To provide appropriate management and monitoring measures for ASS in compliance with the management guidelines (DER, 2015b).
- To undertake an assessment of potential contamination within the onsite fill material in general accordance with NEPM guidelines.

Scope of Work

The scope of work comprised the following:

- A desktop review of historical environmental reports and available online datasets in relation to ASS and groundwater at the Site.
- Collection of soil samples by CMW Geosciences from four soil bores and submitted for field and laboratory testing to confirm the nature and extent of ASS. A limited number of samples were also submitted to the laboratory and tested for a broad suite of contaminants, in order to confirm the nature and extent of any contamination in fill material and implications for management.
- Conversion of two soil bores to groundwater monitoring wells by CMW Geosciences. WEPL collected groundwater samples from these two groundwater monitoring wells with samples subject to field testing and laboratory analysis.
- Preparation of an ASSDMP outlining all soil, groundwater and dewatering effluent investigation results, management and monitoring requirements.

Results

The Site is situated within an area identified as 'moderate to low risk of ASS occurring within 3 m of natural soil surface but high to moderate risk of ASS beyond 3 m of natural soil surface', according to DWER (Figure 2). The ASS field testing results indicate that ASS is likely present across the Site and preliminary SPOCAS results confirmed the presence of PASS at the Site in sand material from approximately 2.5 m below ground level (mbgl) to 6 mbgl within the target excavation zone and below the observed groundwater level. As such ASS management of Site works will be required.

Contamination assessment results indicate one zinc concentration in exceedance of applied EILs, however, the EIL exceedances are not considered to be significant in regard to ecological receptors as the most conservative EILs were applied. If a background sample was collected to determine the ambient background concentration (ABC), the results would likely have been within the Site specific EIL. There are currently no ecological receptors onsite as the Site is cleared and the proposed land use will have minimal opportunities for soil access. The closest sensitive receptor (Swan River) is approximately 200 m to the east and 330 m to the west. Given the current and proposed land use, and lack of identified risk to human health, the ecological exceedance is considered to present a negligible risk.

Field groundwater monitoring results indicate the groundwater beneath the Site to be of moderate buffering capacity and to be vulnerable to acidification. This is based on an assessment of groundwater pH, acidity, alkalinity and the presence of ASS in the target excavation zone. Chemical indicators based on the DER ASS guidelines suggest that groundwater beneath the Site has a moderate buffering capacity and has been slightly affected by ASS (based on the alkalinity to sulfate ratio).

Conclusions

Based on the results of this investigation, ASS is considered present within the Site, including in areas that will likely require dewatering for construction purposes. Groundwater beneath the Site is considered vulnerable to acidification during Site works.

An ASSDMP has been produced to facilitate the Site works, outlining strategies that will be used to ensure that excavated material is adequately managed and that the local ground and surface waters are not adversely affected by the proposed works.

A monitoring programme is in place to ensure that the management strategies are effective, and contingency measures are proposed to enable rapid response should the water quality fall below set action criteria. In potential situations where acidity is generated as a result of Site works, the proposed contingency measures will minimise any adverse impact and there is a commitment by the developer to employ these contingencies should any of the action criteria be triggered.

Recommendations

WEPL recommends the following:

- Review the final reported SPOCAS dataset and revise this management plan in the event that the complete dataset suggests that additional management is required to manage ASS in accordance with the ASS management guidelines (DER, 2015b).
- Installation of one additional groundwater monitoring well on the southern corner of the Site.
- Conduct a baseline groundwater monitoring event immediately prior to the commencement of site works.
- Adherence to the ASSDMP at all times during construction to ensure proper management of environmental risks.
- At the conclusion of works, preparation of an Initial Closure Report as per the guideline requirements, outlining the works, management undertaken and results of monitoring.

Table of Contents

Tables

Figures

Tables (post text)

Appendices

1. Introduction

1.1 Project Background

Western Environmental Pty Ltd (WEPL) was commissioned by CMW Geosciences (the Client) to undertake a contamination and Acid Sulfate Soil (ASS) investigation and prepare an ASS and Dewatering Management Plan (ASSDMP) for 88 Mill Point Road, South Perth (the Site). The Site is located approximately 2 km south of the CBD (Figure 1). The Site is comprised of the following cadastral lots:

- Lot 2 on Plan D000812 - 86 Mill Point Road
- Lot 15 on Plan D018674 - 88 Mill Point Road
- Lot 16 on Plan D018674 - 90 Mill Point Road.

This report documents the investigative works undertaken at the Site and includes a soil and dewatering management plan, prepared in compliance with current DWER guidelines. Note that at the time of this report, WEPL had only received 50% of the confirmatory ASS testing results for the Site; this management plan should be revised in the event that the final data set suggests that additional management is required in accordance with the ASS management guidelines (DER, 2015b).

1.1.1 Proposed Site Works

The proposed development includes the construction of multi-storey apartment building. Ground disturbing activities will be undertaken for the construction of two basement levels and services, as per the plans provided in Appendix A. Activities which may require excavation and dewatering include foundation works, construction of two basement levels, lift pits and crane bases. Maximum anticipated excavation depth is assumed to be approximately 6 m below ground level (mbgl) (4 mAHD).

1.1.2 Preliminary Acid Sulfate Soil Assessment

The Site is in an area of moderate to low ASS risk (Figure 2). It is noted that the mapping is based on regional interpretation of existing geological, topographic and other data sets. The margins and extent of the mapped units are therefore indicative only.

1.2 Objectives

The objectives of the ASSDMP are as follows:

- To undertake an ASS investigation report for the Site, that is consistent with the current ASS investigation guidelines (DER, 2015a).
- To provide appropriate management and monitoring measures for ASS in compliance with the management guidelines (DER, 2015b).
- To undertake an assessment of potential contamination within the onsite fill material in general accordance with NEPM guidelines.

1.3 Scope of Work

The scope of work comprised the following:

- A desktop review of historical environmental reports and available online datasets in relation to ASS and groundwater at the Site.
- Collection of soil samples by CMW Geosciences from four soil bores and submitted for field and laboratory testing to confirm the nature and extent of ASS. A limited number of samples were also submitted to the laboratory and tested for a broad suite of contaminants, in order to confirm the nature and extent of any contamination in fill material and implications for management.
- Conversion of two soil bores to groundwater monitoring wells by CMW Geosciences. WEPL collected groundwater samples from these two groundwater monitoring wells with samples subject to field testing and laboratory analysis.
- Preparation of an ASSDMP outlining all soil, groundwater and dewatering effluent investigation results, management and monitoring requirements.

2. Site Conditions

2.1 Site Identification

A summary of site identification details is provided in Table A.

Table A: Site Details

Identifier	Response
Street Address	88 Mill Point Road, South Perth, WA
Proponent	CMW Geosciences
Proponent's Representative	Tristan Menzies
Certificate of Title: Lot/Plan	Lot 2, Plan D000812 Lot 15, Plan D018674 Lot 16, Plan D018674
Local Government Authority	City of South Perth
Metropolitan Region Scheme Zoning	Urban
Site Coordinates **GDA 94**	Z50 E: 391400 N: 6462114

2.2 Sensitive Receptors

Sensitive receptors at and close to the Site are identified using the Department of Biodiversity, Conservation and Attractions (DBCA) Geomorphic Wetlands - Swan Coastal Plain dataset. These receptors are presented in Figure 3; however, the only sensitive receptor within 1 km of the Site is Swan River (UFI: 13316), approximately 200 m to the east and 330 m to the west (Figure 3).

2.3 Land Use

2.3.1 Historical

Site

The Site comprised of residential properties between 1953 to 1961. By 1965, the residential property on Lot 15 has been removed and part of the Site has been cleared. By 1974, residential buildings consisting of units had been established on Lot 2 and 15 and the eastern end of the Site utilised for parking. In 2016, Lot 2 has been partly cleared and is utilized for parking. By late 2018 the units on Lot 15 and the residential building on Lot 16 had been demolished and the entire site cleared except what is assumed to be the sales office building and carpark. No further onsite changes are noted.

Surrounds

In 1953 (earliest available historical aerial), the Site was surrounded by residential properties. The foreshore land appeared to be predominantly comprised of grass. The Narrows Bridge and Kwinana Freeway are evident from 1961. Continued development is evident from 1953 onwards, including construction of nearby apartment buildings. In 2006, the site immediately to the north-east had been cleared and by 2011 was being developed into apartments. In 2014, the site immediately south-east had been cleared and by 2018, had been developed into apartments.

2.3.2 Zoning

The Metropolitan Region Scheme zoning for the Site and surrounds is identified using the Department of Planning, Lands and Heritage (DPLH) Perth Region Scheme - Zones and Reserves dataset (Figure 4). The zoning of the Site and surrounds can be summarised as follows:

- Site - Urban.
- Surrounds - The Site surrounds are zoned Urban, with areas of Parks and Recreation to the east and west, bordering Swan River. A Primary Regional Road (Kwinana Freeway) lies to the west.

2.3.3 Contaminated Sites

The Contaminated Sites Database holds information on confirmed contaminated sites (those classified as 'contaminated-remediation required', 'contaminated - restricted use' and 'remediated for restricted use'). No confirmed contaminated Site are located onsite or within 1 km of the Site.

2.4 Topography

The topography over the Site is generally flat and ranges from approximately 2.0 metres Australian Height Datum (mAHD) to 2.8 mAHD. The Site and surrounding topography is presented in Figure 5.

2.5 Geology

The geology of the Site and surrounds is shown in Figure 5. The Site consists of the following unit (GSWA, 1986):

- S14 - SAND - white to pale grey, subangular to subrounded, medium to coarse-grained quartz sand, abundant shells and shell fragments of alluvial origin.

The results of the geotechnical investigation undertaken by CMW Geosciences in November and December 2020 identified variability in the thickness of the underlying clay layer (encountered at approximately 8.5 mbgl at BH01 and 13.5 mbgl at BH02), comprised of a mixture of soil types including CLAY, sandy and silty CLAY, SAND, clayey and silty SAND, with occasion GRAVEL at depth.

2.6 Surface Water and Drainage

Surface water is not present at the Site.

2.7 Groundwater

2.7.1 Groundwater Level and Flow Direction

The Perth Groundwater Atlas (DWER, n.d.) reports that the local groundwater level is approximately 1.0 mAHD across the Site, representing a depth of 1.0 m below ground level (m BGL). The saturated thickness of the aquifer is estimated to be 31 m. Groundwater flow is anticipated to be in a north-easterly direction, flowing towards Swan River.

2.7.2 Groundwater Discharge Locations

Groundwater is likely to discharge into Swan River, approximately 200 m north-east of the Site.

2.7.3 Registered Groundwater Bores

Fourteen groundwater bores exist within 1 km of the Site. DWER Water Information Reporting (WIR) database outputs are included in Appendix B.

2.8 Potential Impacts

Potential onsite and offsite impacts related to the disturbance of ASS and dewatering during the site works include:

- Adverse changes to the water quality and metal concentrations of soil water, groundwater, surface water and other environmental receptors.
- Deterioration of any ecosystems of adjacent wetlands, rivers/estuaries and other environmental receptors.
- The potential to oxidise subsurface PASS materials during the temporary lowering of the groundwater table adjacent to excavation areas and in surrounding soils during dewatering activities, with potential for the onset of impacts described above.
- Temporary lowering of the groundwater table by dewatering adjacent to excavation areas can impact the groundwater levels and quality in adjacent third-party bores.
- Cumulative effects of groundwater reduction, including structural effects, particularly the lowering of the groundwater table through dewatering combined with private and public/local government abstraction of groundwater, adjacent to excavation areas.

- Odour and possible human health impacts associated with the release of reduced sulfurous gases (hydrogen sulfide) from ASS during excavation.
- The use of ASS as fill material can affect plant growth and future landscaping.
- Corrosion of concrete, iron, steel and aluminium structures including underground services in the local area and foundations of nearby buildings.
- The loss of visual amenity from staining, scum, slime within local standing waters.
- Costs associated with minimising impacts and repairing disturbed areas.

3. Investigation Methodology

CMW Geosciences undertook soil sampling in conjunction with geotechnical investigations on 25 and 30 November, and 1 and 2 December 2020. Two bore holes (BH01 and BH02) were installed to 30 mbgl and two bore holes (BH03 and BH04) were installed to 8 mbgl. BH03 and BH04 were converted to groundwater monitoring wells (Figure 6) and were installed using a direct push probe method.

3.1 Sampling Locations

3.1.1 Soil - ASS

The ASS sampling locations were designed to test subsurface conditions within the area of planned disturbance to allow for effective interpretation of the underlying substrate. Soil samples were recovered at 0.25 m intervals from all bore holes, with analysis targeting surface soils through to anticipated maximum excavation depth (6 mbgl).

3.1.2 Soil - Contamination

The contamination sampling pattern and locations were designed to target uncontrolled fill material across the Site, within the areas of planned disturbance. Samples were recovered from the top two metres at the following intervals:

- 0.0 mbgl
- 0.5 mbgl
- 1.0 mbgl
- 1.5 mbgl
- 2.0 mbgl.

3.1.3 Groundwater

The locations of groundwater monitoring wells (BH03 and BH04, Figure 6) were selected to include assessment of both up- and down-hydraulic gradient conditions, and to provide an appropriate assessment of baseline groundwater conditions prior to the commencement of Site works. The groundwater monitoring wells were converted from the soil bores installed in the northern and south-western boundaries of Site.

3.2 Soil Testing and Analysis

3.2.1 Field Testing

Soil samples were recovered at 0.25 m intervals from surface to termination depth in all bore holes. Samples were immediately deposited into eskies and kept chilled before being sent to a National Association of Testing Authorities (NATA)-accredited laboratory for field testing (Eurofins-MGT).

A total of 100 samples were tested for pH_{FIELD} and pH_{FOX}, as per the approved laboratory methodology. The classification parameters for field test results are referenced in Section 4.

3.2.2 Laboratory Analysis - ASS

Seventeen primary samples were submitted for confirmatory laboratory analysis based on interpretation of soil logs, water table depth and the results of the field pH testing.

These samples were analysed using the Suspension Peroxide Oxidation Combined Acidity Sulfur (SPOCAS) suite according to the ASS guideline (DER, 2015a) requirements.

3.2.3 Laboratory Analysis - Contamination

Eight primary samples were submitted for laboratory analysis based on interpretation of soil logs, fill material depth and field observations.

These samples were analysed for a broad range of contaminants which included the following analytes:

- Metals - arsenic, cadmium, chromium, copper, mercury, nickel, lead and zinc.
- Organochlorine pesticides (OCP).
- Benzene, toluene, ethylbenzene and xylene (BTEX), total petroleum hydrocarbons (TPH) and total recoverable hydrocarbons (TRH).
- Polycyclic aromatic hydrocarbons (PAH).

3.3 Groundwater Testing and Analysis

Following the installation of BH03 and BH04, one week was allowed for groundwater around the wells to stabilise, after which sampling of the wells was undertaken on 9 December 2020. Groundwater quality was monitored in the field for physical and ASS indicator parameters.

Samples from both wells (including one duplicate) were collected into laboratory issued sample bottles following the stabilisation of field parameters and were immediately deposited into eskies. Samples were chilled and sent to a NATA-accredited laboratory for testing using the ASS Groundwater Quality Suite, according to the requirements of the current ASS guidelines (DER, 2015a and DER, 2015b).

3.4 Quality Assurance and Quality Control

3.4.1 Soils

All sampling procedures were undertaken in accordance with the methodology prescribed in the guidelines and relevant Australian Standards for soil sampling (Standards Australia, 2005), which includes provisions for sample collection and decontamination of sampling equipment, storage, transport and data collection. Soil bore logs are included in Appendix C.

CMW Geosciences did not collect any duplicate soil samples during the installation of bore holes 1 to 4.

Analyses of primary samples were conducted at a NATA-accredited laboratory (Eurofins-MGT), under recognised Chain of Custody (CoC) procedures. Quality assurance/quality control (QA/QC) sample results are discussed in Section 4.

3.4.2 Groundwater

Groundwater well installation was undertaken in accordance with the methodology prescribed in the guidelines and relevant Australian Standards (Standards Australia/Standards New Zealand, 1998), which includes provisions for well construction methods, materials and screen lengths. Well construction logs are included in Appendix C.

Groundwater sampling was undertaken in accordance with the low-flow sampling methodology prescribed in the guidelines and relevant Australian Standards, which includes provisions for equipment, parameters to be monitored, sample collection and decontamination of sampling equipment, storage, transport and data collection. All equipment and instruments are owned and maintained by WEPL and were calibrated in accordance with manufacturer's specifications prior to use. Calibration certificates are recorded on file and can be provided upon request.

Field duplicate samples were collected at the minimum rate of one duplicate per 20 primary samples, for a total of one duplicate sample for two primary samples collected.

Analyses of primary and duplicate samples were conducted at Eurofins-MGT, under recognised CoC procedures. QA/QC sample results are discussed in Section 4.

4. Results

4.1 Adopted Assessment Criteria

Assessment of potential risks to human health and/or the environment is made through the comparison of analytical results to established threshold levels or acceptance criterion. These criteria are dependent mainly on the proposed ongoing use of the Site (in this case high density residential), potentially sensitive re-use, the associated risks (either on or offsite), and the soil profile encountered (fine to coarse). Assessment criteria have been largely sourced from the following guidelines:

- *Identification and Investigation of Acid Sulfate Soils and Acidic Landscapes* (DER, 2015a).
- *Treatment and Management of Soil and Water in Acid Sulfate Soils Landscapes* (DER 2015b).
- *Assessment and Management of Contaminated Sites* (DER, 2014).
- *National Environment Protection (Assessment of Site Contamination) Amendment Measure* (NEPC, 2013).
- CRC CARE (2011) *Technical Report no. 10 Health screening levels for petroleum hydrocarbons in soil and groundwater.*

4.1.1 Soils - ASS

The following assessment criteria have been adopted for soils:

- 0.03 %S (equal to or greater than) DER (2015a).

4.1.2 Soils - Contamination

Health Investigation Levels

Health investigation levels (HILs) are scientifically based, generic assessment criteria designed to be used in the first stage (Tier 1 or 'screening') of an assessment of potential risks to human health from chronic exposure to contaminants. They are intentionally conservative and are based on a reasonable worst-case scenario for generic land use settings. Soil analytical results were compared with criteria provided in the NEPM (NEPC, 2013) as follows:

- HIL-B – High Density Residential.

Health Screening Levels for Petroleum Hydrocarbons

Health screening levels (HSLs) have been developed for selected petroleum hydrocarbon compounds and fractions and are applicable to assessing human health risk via inhalation and direct contact pathways. HSLs are applied from surface soils to depths > 4 mbgl and are dependent on specific soil physiochemical properties, land use scenarios and the characteristics of building structures. Soil analytical results were compared with CRC CARE (2011) Technical Report No. 10 HSL criteria as follows:

- HSL-B Direct Contact- Residential (High Density).
- HSL Direct Contact - Intrusive Maintenance Worker.
- HSL A&B Vapour Intrusion (Sand) - Low-high density residential, Sand (0 - <1m).
- HSL Vapour Intrusion (Sand) - Intrusive Maintenance Worker, Sand (0 - <2m).

Ecological Investigation Levels

Ecological investigation levels (EILs) are applicable for assessing risk to terrestrial ecosystems. EILs depend on specific soil physiochemical properties and land use scenarios and generally apply to the top 2 m of soil. Soil analytical results will be compared with criteria provided in the NEPM (NEPC, 2013) as follows:

- EILs – for urban residential and public open space (POS) land uses.

EILs presented in the NEPM (NEPC, 2013) have been derived for certain analytes. EILs principally apply to contaminants in the top 2 m of soil at the finished surface/ground level which generally corresponds to the root zone and habitation zone of many species. This methodology assumes that the ecosystem is adapted to the ambient background concentration (ABC) for the locality and that it is only adding contaminants over and above this background concentration which has an adverse effect on the environment. An added contaminant limit (ACL) is the added concentration of a contaminant above which further appropriate investigation and evaluation of the impact on ecological values is required. ACLs are based on the soil characteristics of pH, cation exchange capacity (CEC) and clay content. Site-specific EILs for certain analytes can then be derived by adding the ACL and ABC; however, a background sample was not collected as part of this investigation and the most conservative values associated with the proposed land use have been adopted.

Ecological Screening Levels

Ecological screening levels (ESLs) have been developed for selected petroleum hydrocarbon compounds and total petroleum hydrocarbon (TPH) fractions and are applicable to assessing risk to terrestrial ecosystems generally applicable to the top 2 m of soil. Soil analytical results will be compared with criteria presented in the NEPM (NEPC, 2013) as follows:

- ESLs (fine and coarse soil) – for urban residential and POS land uses.

4.1.3 Groundwater

The following assessment criteria have been adopted for groundwater:

- ANZG (2018) Fresh Water 95 % Guidelines (FWG).
- ANZG (2018) Marine Water 95 % Guideline (MWG).
- Department of Health (2014) Domestic Non-Potable Groundwater Use (NPUG).
- Department of Water and Environmental Regulation (2015a) ASS Indicators.
- Water Corporation acceptance criteria for trade waste.

4.2 Soil Profile

Soil bore logs are included in Appendix C. The observed soil profile across the Site within the anticipated excavation depth (6 mbgl) broadly consists of the following:

BH01

- 0 - 2.9 mbgl: FILL, sand with traces of silt and/or gravel, brown, fine to coarse grained.
- 2.9 - 6.0 mbgl: SAND, grey, fine to coarse grained.

BH02

- 0 - 0.5 mbgl: Silty SAND with traces of gravel, brown, fine to medium grained.
- 0.5 - 3.0 mbgl: SAND, occasionally with traces of silt, grey, fine to medium grained.
- 3.0 to 6.0 mbgl: SAND, grey, fine to coarse grained.

BH03

- 0 - 0.3 mbgl: FILL, gravelly sand, dark brown, fine to medium grained.
- 0.3 - 3.0 mbgl: SAND, occasionally with traces of silt, yellowish brown, fine to medium grained.
- 3.0 - 6.0 mbgl: SAND, grey, fine to coarse grained.

BH04

- 0 - 0.6 mbgl: FILL, sand with trace silt and trace gravel, brown, fine to medium grained, some trace organics material (roots).
- 0.6 - 3.0 mbgl: SAND, grey to brown with depth, fine to medium grained, with some trace organic material (roots) to 1.2 mbgl.
- 3.0 - 6.0 mbgl: SAND, pale brown, fine to medium grained.

4.3 Results

4.3.1 Soil - ASS Results

Field and laboratory soil ASS results are provided in Table 1, with the laboratory CoCs and Certificates of Analysis (CoAs) provided in Appendix D.

A summary of the ASS field and laboratory results is given as follows:

- pH_{FIELD} values ranged from 5.2 to 9.8. No exceedances of the DER ASS indicator criteria (pH_{FIELD} < 4) were observed.
- pH_{FOX} values ranged between 2.1 and 7.8. Twenty-six exceedances of the DER ASS indicator criteria (pH_{FOX}< 3) were observed (26% of primary samples). Exceedances were observed in BH01, BH02 and BH04, at depths ranging from 2.0 mbgl to 6 mbgl. No exceedances were observed in BH03.
- Exceedances of the indicative field test criteria for pH Δ (>2) were observed in 67 of the 100 primary samples analysed (67 % of primary samples).
- At the time of this report, WEPL had received 50% of the SPOCAS results for the Site. Following SPOCAS analysis, concentrations of titratable peroxide acidity (TPA), sulfur peroxide oxidisable sulfur (SPOS) and SPOCAS in exceedance of the DER ASS action criteria (0.03 %S) were observed in BH04 samples at the following intervals:
    - BH04_3.0: TPA (0.13 %S), SPOS (0.12 %S) and SPOCAS (0.14 %S).

4.3.2 Soil - Contamination Results

Laboratory soil contamination results and associated QA/QC data are provided in Tables 2 - 5. Associated laboratory documentation is included in Appendix D.

A summary of the contamination analytical results is given as follows:

- All metal results were below adopted assessment criteria and/or laboratory limits of reporting (LOR) with the following exceptions:
    - The zinc concentration observed at BH03_0.5 (95 mg/kg) exceeded the adopted EIL guideline criteria (70 mg/kg).
- All OCP concentrations were reported below laboratory LORs and applicable assessment criteria.
- All petroleum hydrocarbons (TRH, BTEX and PAH) concentrations were reported below laboratory LORs and applicable assessment criteria.

4.3.3 Groundwater

Laboratory ASS groundwater results and associated QA/QC results are provided in Table 6. Laboratory documentation is included in Appendix D. Field monitoring data is presented in Table B below, with the field monitoring logs presented in Appendix E.

Table B: Groundwater Field Monitoring Data

Date	Well ID	pH	EC (µs/cm)	ORP (mV)	DO (%)	TTA (mg/L)	TAlk (mg/L)	Groundwater Level (mTOC)
09/12/2020	BH03	7.78	760	-35.7	30.2	10	14	2.44
	BH04	7.78	617	-61.3	44.3	22	6	2.03

A summary of the groundwater field and laboratory results is given as follows:

- All dissolved metal concentrations were below assessment criteria, expecting dissolved zinc which exceeded the MWG criteria (0.015 mg/L) at all locations. Concentrations ranged from 0.016 mg/L (BH04) to 0.025 mg/L (BH03).
- Total metal concentrations remained below applicable assessment criteria with the following exceptions noted:
    - The aluminium concentration observed at BH03 (0.34 mg/L), exceeding the DER ASS indicator criteria (0.15 mg/L).
- The pH at all locations was outside of the MWG criteria range (8 to 8.4 pH units).
- The alkalinity to sulfate ratio exceeded the DER ASS indicator criteria (< 5) at BH04.

4.4 QA/QC Results

Duplicate samples were submitted to a Relative Percentage Difference (RPD) calculation. The RPD calculation is used to normalise each pair of results to allow for better QA/QC data interpretation. For those RPD values which exceed a generally acceptable 30% (NEPC, 2013) data correlation is considered poor; however, consideration needs to be given to sample homogeneity and the concentrations detected.

The laboratory is normally required to meet these criteria before reporting results. In some circumstances if the RPD % or the spike recovery rate exceed the relevant threshold, but the measured concentrations are close to the detection limit and well below guideline concentrations, the laboratory may not be required to re-analyse the sample. If the calculated RPD exceeds 30 %, then the highest value will be used for assessment purposes.

4.4.1 Soil

No duplicate soil samples were collected by CMW Geosciences during the sampling and construction of soil bores 1 to 4.

4.4.2 Groundwater

The duplicate groundwater sample subject to RPD analysis identified no exceedances of acceptable criteria (30%).

4.5 Discussion

The Site is situated within an area identified as 'moderate to low risk of ASS occurring within 3 m of natural soil surface but high to moderate risk of ASS beyond 3 m of natural soil surface', according to DWER (Figure 2). The ASS field testing results indicate that ASS is likely present across the Site and preliminary SPOCAS results confirmed the presence of PASS at the Site in sand material from approximately 2.5 m below ground level (mbgl) to 6 mbgl within the target excavation zone and below the observed groundwater level. As such ASS management of Site works will be required.

Contamination assessment results indicate one zinc concentration in exceedance of applied EILs, however, the EIL exceedances are not considered to be significant in regard to ecological receptors as the most conservative EILs were applied. If a background sample was collected to determine the ambient background concentration (ABC), the results would likely have been within the Site specific EIL. There are currently no ecological receptors onsite as the Site is cleared and the proposed land use will have minimal opportunities for soil access. The closest sensitive receptor (Swan River) is approximately 200 m to the east and 330 m to the west. Given the current and proposed land use, and lack of identified risk to human health, the ecological exceedance is considered to present a negligible risk.

Field groundwater monitoring results indicate the groundwater beneath the Site to be of moderate buffering capacity and to be vulnerable to acidification. This is based on an assessment of groundwater pH, acidity, alkalinity and the presence of ASS in the target excavation zone. Chemical indicators based on the DER ASS guidelines suggest that groundwater beneath the Site has a moderate buffering capacity and has been slightly affected by ASS (based on the alkalinity to sulfate ratio).

5. Management Overview

5.1 Scope and Objectives

The ASSDMP has been produced to manage site works and has the following objectives:

- Provide guidance for ASS management during excavation and dewatering at the site to minimise risk of adverse impact to soil, groundwater and sensitive receptors.
- Implement a monitoring programme to track the quality of soil, groundwater and abstracted dewatering effluent.
- Define contingency measures to address the potential adverse impacts.

5.2 Roles and Responsibilities

Table C: Roles and Responsibilities

Responsible Party	Task	Reporting to	Timeframe / Frequency
ASS Soil Excavation Programme			
Earthworks Contractor	A clear method statement of proposed treatment regime for ASS material.	Western Environmental	Prior to commencement of works
Earthworks Contractor	Track the total volume of ASS disturbed, dates of disturbance, quantity of neutralising agent used and location of stockpile.	Western Environmental	At the end of each week.
Western Environmental	Soil validation and sampling results and advice.	Contractor's Representative	5 working days after sample collection
Dewatering Programme			
Dewatering Contractor	Continuously monitor dewatering discharge rate, pH, TTA, TALK and water clarity of dewatering effluent.	Western Environmental	Daily during dewatering works.
Western Environmental	Monitoring of field parameters: SWL, pH, DO, EC, ORP, TTA, TALK of three groundwater monitoring wells	Client / Regulator	Three times per week during dewatering works.
Western Environmental	Submission of groundwater and effluent samples for pH, EC, TTA, TALK, TDS, sulfate, chloride, metals, TN, TP, FRP.	Client / Regulator	Fortnightly during dewatering works.
Western Environmental	Initial Closure Report, detailing all aspects of groundwater, surface water and dewatering management.	Client / Regulator	On completion of dewatering program.
Western Environmental	Post-dewatering Monitoring and Final Closure Report (if the task requirement is identified upon the cessation of ASS disturbance activities).	Client / Regulator	On completion of post-dewatering groundwater monitoring program

5.2.1 Competent and Independent Management

The supervision of site works and monitoring of soil, groundwater and dewatering activities must be undertaken by a qualified, independent consultant who meets the following minimum criteria:

- All personnel utilised on the project must be suitably trained and have specific experience in the management of ASS in the construction and land development sector.
- All personnel are required to have the minimum tertiary qualifications (B.Sc. or equivalent).
- Consultants responsible for the collection and interpretation of data and compliance reporting must be demonstrably independent of site contractors to ensure transparency and accountability, and avoid potential conflicts of interest.

5.3 Soil Management

5.3.1 Staging of Works

The timeline for excavation and backfilling of soil will be minimised by ensuring excavation activities are as efficient as possible. Earthwork staging will minimise the area of disturbance and minimise the length of time in situ ASS are exposed.

5.3.2 Site Bunding

Stockpiling areas will be bunded in accordance with Table D. If surface water run-off is observed onsite, bunding will be installed using non-ASS materials with testing as per Table D. The location of stockpiled ASS material and infiltration basins will also be chosen to best minimise this risk.

5.3.3 ASS Material Not Identified During Investigation

If any previously unidentified coffee rock/sands, strongly organic/peaty soils or soils exhibiting a sulfurous odour are identified by the contractor during works, WEPL is to be notified immediately to assess.

5.3.4 Timeframe

Works are anticipated to commence at the Site in mid to late 2021 and ground disturbing activities may take up to six months to complete.

5.3.5 Extent of ASS Management

The following categories define the extent of ASS management required. These are based on the SPOCAS results for BH04 and the preliminary results for BH01 and BH02 and may be subject to change once WEPL receive the final SPOCAS analytical results for the Site.

- **Non- ASS**: All soils from the surface to the depth of confirmed PASS at groundwater level (2.0 mbgl).

- **ASS:** All soils from 2.0 mbgl and deeper.

5.3.6 Soil Excavation

Site works will involve the excavation of soil, including soils from below the water table. Controls to minimise the risks associated with the disturbance of ASS will include:

- Separation of Non-ASS substrate from AASS/PASS zone substrate during excavation.
- Lining the base of any AASS/PASS zone excavations with 100 mm of lime media prior to construction of basement.
- Limiting the extent of excavations and dewatering activities as much as possible. Once the deepest excavations are completed, maintenance will begin and groundwater levels will be reinstated as quickly as possible.

5.3.7 Soil Management

Due to site constraints, there is only one option for soil management, being offsite disposal. Soils may be stored onsite temporarily until they can be loaded for haulage. All material must be disposed to a facility licensed to receive and treat ASS, and accurate records of haulage must be kept and provided to WEPL for reporting.

These activities above must be managed in accordance with Table D.

Table D: Soil Management and Validation

Activity	Controls
1. Stockpiling	• Stockpiles will be kept small (approximately 100 m^3). • Treatment pads will be 300 mm compacted limestone base with 150 mm bunding to all sides. • Surface water run-off from stockpiles will be contained within the bunded area. • At the conclusion of works the treatment pad must be validated by WEPL prior to decommissioning.
2. Landfill Disposal	• WEPL will test all material for offsite disposal as per Landfill Waste Classification and Waste Definitions 2019, prior to disposal. • **All material must be disposed to a facility licenced to receive ASS**, with all haulage dockets to be retained and provided to WEPL for reporting.
3. Stockpile Pad Decommissioning	• Once site works have concluded, the treatment pad at the site will require decommissioning. • Sampling and analysis of the residual liming media will be required to determine whether it is suitable for retention onsite or should be disposed of offsite. • Assessment for offsite disposal should be according to the Landfill Waste Classification and Waste Definitions 2019, including at least analysis for metals, but in addition should include ASS analyses (e.g. SPOCAS) to determine the residual sulfidic nature of the material. Positive identification of residual ASS material in the sludge may require disposal to facilities licensed to treat ASS.

5.4 Dewatering Management

5.4.1 General Measures

The management measures prescribed herein are intended to minimise any environmental impact. If unacceptable environmental impact occurs, remediation of groundwater may be required. General measures are as follows:

- Dewatering operations will involve the temporary abstraction of groundwater by use of a dewatering spear array / open pump. The general objective of managing dewatering is to minimise its duration and localise the consequent cone of groundwater depression as much as possible.
- The timeline for dewatering will be minimised by ensuring excavations occur in a staged approach and in the fastest timeframe possible, with dewatering ceasing as soon as construction works are completed along each segment of sewer installation.
- Excavation plans will be designed to minimise the vertical and lateral extent of groundwater drawdown and also to minimise the amount of time ASS material is exposed to the atmosphere.
- The site engineer will be briefed on the potential problems associated with dewatering in ASS areas and subsequently dewatering contractors will be instructed and supervised for adherence to the dewatering protocols.
- Site contractors must be supervised by qualified environmental personnel to ensure that soil and water management occurs in accordance with the management plan.

5.4.2 Dewatering Drawdown

Comparison of finished infrastructure levels (plus an additional 0.5 m buffer) with measured groundwater levels has confirmed that dewatering will be required. Maximum drawdown in groundwater levels during the project will be approximately 5.0 m below current groundwater levels. In the absence of detailed development plans, the maximum excavation depths have been assumed to be approximately 6.5 mbgl.

5.4.3 Dewatering Abstraction Volumes

Abstraction rates and durations are based on information provided by the client or their representatives, including modelling performed by third parties regarding basement construction and cut-off achieved to reduce ingress rates. All estimations are indicative only. The expected groundwater abstraction rates, durations and volumes are provided in Table E.

Table E: Estimated Abstraction Volume

Average Pump Rate (L/s)	Daily Volume (kL)	Duration (weeks)	Total (kL)
6 (assumed based on modelling by third parties)	518.4	24	87,091.2

5.4.4 Cone of Depression

An estimate of the radius of influence of dewatering (R_0) has been calculated using a numerical model consistent with the guidelines, and applying the hydraulic parameters inferred based on site investigations.

The resulting maximum cone of groundwater depression is estimated to be 114 m, however the use of construction technology (e.g. diaphragm wall) is expected to substantially reduce the maximum cone of depression to less than 100 m.

5.4.5 Dewatering Management Level

The following parameters apply to the dewatering program:

- Duration is > 7 days.
- Groundwater Cone of Depression is > 50 m.

In accordance with Section 6.2.3 of the relevant guideline (DER, 2015b), Dewatering Management Level 2 is required for this project. The following management strategy has been prepared in accordance with this.

5.4.6 Effluent Disposal

Based on the current development plans for the Site, a preliminary effluent disposal strategy has been devised. Given the finish level for the second basement is below groundwater, dewatering across the entire Site will be required. The discharge management hierarchy will be as follows:

1. **Onsite re-infiltration:** if possible, works should be scheduled to allow adequate space for onsite re-infiltration in early stages of construction for each item of infrastructure requiring installation below the water table. Basin sizes and locations are to be determined by the successful contractor. Typically, the City of South Perth is opposed to onsite basin infiltration, however the proposed basement and piling construction methodology, combined with the small excavation footprint, renders this a very low risk proposition that is considered acceptable.

2. **Sewer discharge:** given the constrained size of the Site, shallow depth to groundwater and anticipated dewatering rates, discharge to sewer is considered a valid contingency option for effluent disposal. An application for a One-off Discharge of Trade Waste to Sewerage Works permit must be approved by the Water Corporation for this option. Baseline groundwater monitoring undertaken at the Site indicates groundwater to be suitable for discharge to sewer, with no exceedances of the Water Corporation trade waste acceptance criteria observed. The peak rate achievable in South Perth for sewer discharge is 10L/sec, with an accessible main along Mill Point Road. The ultimate discharge rate approved by Water Corporation will however be subject to main accessibility and the status of other applications from adjacent sites and their discharge volumes and rates.

3. **Aquifer re-injection:** as a contingency, aquifer reinjection external to the basement piling could be used to manage excess dewater in the event <6 L/sec discharge rate is approved by Water Corporation. The injection array would be the responsibility of the successful contractor to design and implement.

Stormwater disposal and aquifer re-injection is a potential fourth option; however, groundwater quality precludes discharge to stormwater without significant treatment, which is unlikely to be efficacious with regard to nitrogenous species. If stormwater discharge is proposed by the successful contractor, further negotiations, revision of this plan, and written approval will be required from DBCA prior to this option being exercised.

5.4.7 Effluent Treatment Procedure

Effluent requires minimal treatment (e.g. passage through a settlement tank and lime dosing unit (LDU) if required, prior to onsite or sewer discharge). An idealised layout of infrastructure is presented in Figure 6, subject to change based on the construction plans of the successful contractor. The following effluent treatment procedure will be undertaken at the Site in the event effluent is discharged to ground:

- Dewatering effluent will be treated based on observed water quality. In the event dewatering effluent does not meet the minimum criteria (pH > 6.5, total acidity < 40 mg/L), effluent will be initially treated in a passive manner by lime addition into the settlement basin or tank. In the event dewatering discharge pH decreases to < 6.5 and total acidity increases above 40 mg/L as CaCO3 beyond this point, a lime dosing plant (LDP) will be commissioned.

- Dewater will be aerated prior to entering the basin array. An appropriately sized, impermeable sedimentation basin will be constructed using crushed, compacted limestone and will receive discharge waters prior to overflow into the infiltration basin.

- Water discharged to the infiltration basin will undergo testing and be subject to action criteria and contingency measures as discussed in the following section.

- Depending on the recorded water quality, infiltration rates and drawdown impacts, additional infiltration basins or alternative options may be considered.

In the event dewater is discharged to sewer, the following will apply:

- A settlement tank and other mandatory infrastructure as specified by Water Corporation will be setup prior to discharge.
- Water Corporation approval and inspection of apparatus will be required prior to the commencement of discharge.

In the event aquifer re-injection is undertaken, water treatment will be undertaken at a minimum to comply with the above specifications for onsite infiltration with additional treatment at the discretion of the successful contractor in order to achieve an optimal injection rate over the life of project.

5.4.8 Basin Commissioning and Decommissioning

The procedure for decommissioning onsite infiltration basins (if any) is as follows:

- Sampling and analysis of the residual liming media and base of basins will be required to determine whether it is suitable for retention onsite or should be disposed of offsite.
- Assessment for offsite disposal should be according to the Landfill Waste Classification and Waste Definitions 2019, including analyses for metals and ASS parameters to determine the residual sulfidic nature of the material. Positive identification of residual ASS material in the sludge may require disposal to facilities licensed to receive ASS.

6. Monitoring Programme

The monitoring programme has the objective of ensuring that no potentially adverse impacts to the environment occur as a result of the dewatering activities. Dewatering effluent and groundwater will undergo testing and be subject to action criteria and contingency measures as discussed herein.

The monitoring programme will consist of three monitoring wells (BH03, BH04 and MW01 (proposed)), situated to assess up-, down- and cross-hydraulic gradient groundwater from Site works. Should onsite infiltration be utilised, pre-treatment (PRE) and post-treatment (POST) dewatering effluent locations will also be monitored. The monitoring programmed is outlined in Tables F and G, with sampling locations indicated in Figure 6 (indicative locations only - subject to finalisation). These locations are subject to monitoring during any periods of dewatering.

Table F: Groundwater Monitoring Programme

Frequency	Sampling	Party	Analytes	Assessment Criteria	Control Measure / Action Criteria
Prior to Start	Lab Analysis	WEPL	• Water Level. • pH, EC, TDS, TTA, Talk, sulfate and chloride. • Dissolved (filtered) metals: Al, As, Cr, Cd, Fe, Mn, Ni, Zn, Se. • Total metals: Al, Fe. • TN, NH3, TP, FRP.	• ±10% Baseline • FWG • MWG • NPUG • ASS	• Taken immediately prior to commencement of dewatering. • To establish performance criteria for comparison. Baseline performance criteria will be set to within ±10% of the baseline level for each parameter.
Thrice per week	Field Analysis	WEPL	• Water Level • pH/EC • Total acidity/alkalinity • Redox • Dissolved Oxygen	N/A	• Groundwater is not to exceed 10 cm at a distance of 100 m from the works location. • Monitoring will continue until the conclusion of dewatering. If parameters breach performance criteria, re-testing will be required within 24 hours. Should re-testing show non-compliance, ground disturbing works will cease and advice will be provided on further corrective actions and management prior to works resuming.
Fortnightly	Lab Analysis	WEPL	• pH, EC, TDS, TTA, Talk, sulfate and chloride. • Dissolved (filtered) metals: Al, As, Cr, Cd, Fe, Mn, Ni, Zn, Se. • Total metals: Al, Fe. • TN, NH3, TP, FRP.	• ±10% Baseline • FWG • MWG • NPUG • ASS	

Table G: Dewatering Effluent Monitoring Programme

	Trigger (PRE effluent quality)	Action	Monitoring / Control Measures
1	Total Titratable Acidity <40mg/L, pH>6	Continue daily field measurements of pH and Total Titratable Acidity.	Daily - field measurement: pH, EC, DO, EC, TTA, Talk. Fortnightly - laboratory analysis: total acidity, total alkalinity, pH
2	Total Titratable Acidity <40mg/L, pH in range 4 to 6	Undertake neutralisation treatment (liming).	Daily - field measurement: pH, EC, DO, EC, TTA, Talk. Weekly - laboratory analysis: total acidity, total alkalinity, pH
3	Total Titratable acidity in range 40 - 100mg/L, pH>6	Effluent should be aerated to precipitate dissolved metals. Undertake neutralisation treatment (liming).	Daily - field measurement: pH, EC, DO, EC, TTA, Talk Weekly - laboratory analysis: total acidity, total alkalinity, pH
4	Total Titratable acidity in range 40-100mg/L, pH in range 4 to 6	Effluent should be aerated to precipitate dissolved iron and directed to a series of settlement basins/trenches or other treatment system to allow removal of iron and other metals. Undertake neutralisation treatment (liming).	Daily - field measurement: pH, EC, DO, EC, TTA, TAlk Weekly -laboratory analysis: total acidity, total alkalinity, pH Fortnightly - laboratory analysis: total acidity, total alkalinity, pH, sulfate, chloride, sodium, total iron, dissolved iron (filtered), total aluminium, dissolved aluminium (filtered), total arsenic, total chromium, total cadmium, total manganese, total nickel, total zinc, total selenium, ammoniacal nitrogen, hydrogen sulfide, EC, Total Suspended Solids (TSS), Total Dissolved Salts (TDS), Total Nitrogen (TN), Total Phosphorus (TP)
5	Total Titratable acidity >100mg/L or pH<4 or total alkalinity <30mg/L	Effluent should be aerated to precipitate dissolved iron and directed to a series of settlement basins/trenches or other treatment system to allow removal of iron and other metals. Increase neutralisation treatment (liming) rate. Advise Contaminated Sites Branch (CSB) of DER immediately. CSB may advise appropriate action which may include ceasing dewatering.	Daily – field measurement: pH, EC, DO, EC, TTA, TAlk Weekly - laboratory analysis: total acidity, total alkalinity, pH, sulfate, chloride, sodium, total iron, dissolved iron (filtered), total aluminium, dissolved aluminium (filtered), total arsenic, total chromium, total cadmium, total manganese, total nickel, total zinc, total selenium, ammoniacal nitrogen, hydrogen sulfide, EC, TSS, TDS, TN, TP May be needed to undertake investigations to determine the size of the 'acidic footprint' created and manage this impact appropriately.
6	Total titratable acidity >100mg/L and 25% higher than baseline values	Upgrade to 'Dewatering Management Level 2' including implementation of groundwater quality monitoring program	Monitoring requirements: Dependent upon value of total titratable acidity and pH as per guidance above.
7	pH decrease >1 pH unit from baseline values	Upgrade to 'Dewatering Management Level 2' including implementation of groundwater quality monitoring program	Monitoring requirements: Dependent upon value of total titratable acidity and pH as per guidance above.

7. Conclusions and Recommendations

7.1 Conclusions

Based on the results of this investigation, ASS is considered present within the Site, including in areas that will likely require dewatering for construction purposes. Groundwater beneath the Site is considered vulnerable to acidification during Site works.

An ASSDMP has been produced to facilitate the Site works, outlining strategies that will be used to ensure that excavated material is adequately managed and that the local ground and surface waters are not adversely affected by the proposed works.

A monitoring programme is in place to ensure that the management strategies are effective, and contingency measures are proposed to enable rapid response should the water quality fall below set action criteria. In potential situations where acidity is generated as a result of Site works, the proposed contingency measures will minimise any adverse impact and there is a commitment by the developer to employ these contingencies should any of the action criteria be triggered.

7.2 Recommendations

WEPL recommends the following:

- Review the final reported SPOCAS dataset and revise this management plan in the event that the complete dataset suggests that additional management is required to manage ASS in accordance with the ASS management guidelines (DER, 2015b).
- Installation of one additional well on the southern corner of the Site.
- Conduct a baseline groundwater monitoring event immediately prior to the commencement of site works.
- Adherence to the ASSDMP at all times during construction to ensure proper management of environmental risks.
- At the conclusion of works, preparation of an Initial Closure Report as per the guideline requirements, outlining the works, management undertaken and results of monitoring.

8. References

ANZG 2018. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. A joint initiative of the Australian and New Zealand Governments in partnership with the Australian state and territory governments, Online. <http://www.waterquality.gov.au/anz-guidelines>.

CRC CARE, 2011. *Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater - Technical Report No. 10.* Cooperative Research Centre for Contamination Assessment and Remediation of the Environment.

DER, 2014. *Assessment and Management of Contaminated Sites – Contaminated Sites Guidelines.* Department of Environment Regulation.

DER 2015a, *Identification and Investigation of Acid Sulfate Soils and Acidic Landscapes*. Acid Sulfate Soils Guideline Series, Department of Environmental Regulation, June 2015.

DER 2015b, *Treatment and Management of Soil and Water in Acid Sulfate Soils Landscapes*, Acid Sulfate Soils Guideline Series, Department of Environment Regulation, June 2015.

DoH, 2014. *Contaminated sites ground and surface water chemical screening guidelines*. Department of Health.

DWER (n.d.), *Perth Groundwater Map*, accessed November 2020.

Geological Survey of Western Australia (GSWA) 1986, Perth Metropolitan 1:50 000 Environmental Geology Series, Western Australia.

NEPC, 2013. *National Environment Protection (Assessment of Site Contamination) Amendment Measure*. National Environment Protection Council.

Standards Australia/Standards New Zealand (1998). AS/NZS 5667.11:1998, *Water Quality – Sampling. Part 11: Guidance on Sampling of Groundwaters*, Joint Committee EV/8, Methods of Examination of Waters, Joint Standards Australia/ Standards New Zealand, 05 April 1998.

Datasets used

Department of Biodiversity, Conservation and Attractions, *Geomorphic Wetlands - Swan Coastal Plain (DBCA-019).*

Department of Planning, Lands and Heritage, *Region Scheme - Zones and Reserves (DPLH-023).*

Department of Water and Environmental Regulation, *Acid Sulfate Soil Risk Map - Swan Coastal Plain (DER-003).*

Department of Mines, Industry Regulation and Safety (2017), *Geological Survey of Western Australia (1986),* State of Western Australia.

Figures

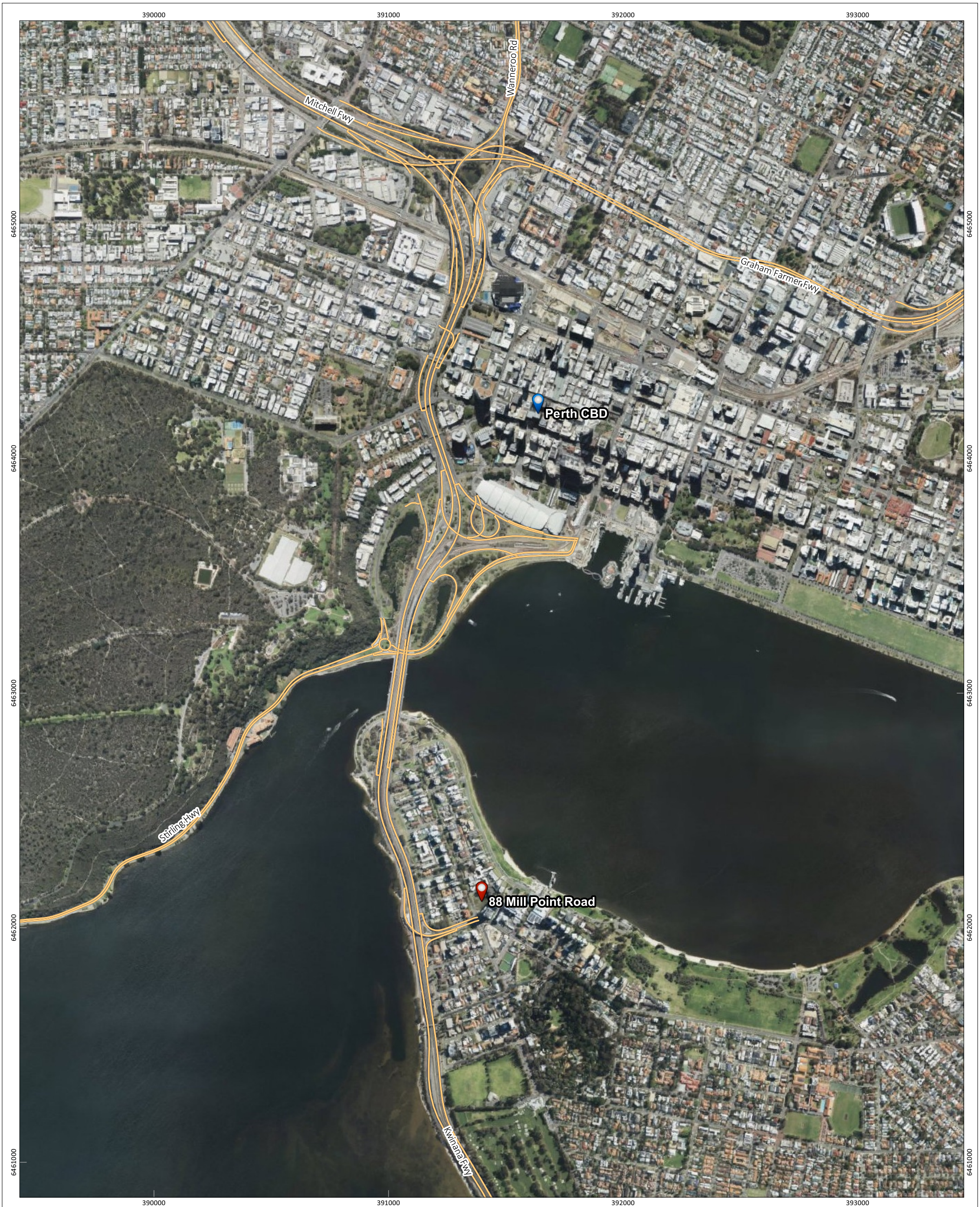


Figure 1: Site Location

N 0 250 500 m		PROJECT / REPORT NAME: ACID SULFATE SOIL AND DEWATERING MANAGEMENT PLAN 88 MILL POINT ROAD, SOUTH PERTH	
SCALE: 1:15000	SHEET SIZE: A3 COLOUR	CLIENT: CMW GEOSCIENCES	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: P20.227	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY 08/2020		DRAWN BY / REVIEWED BY: LP / PB	DATE: 18/12/2020

Legend

- Perth CBD pin
- Site Location
- Primary Distributor Road

WESTERN ENVIRONMENTAL

\\Hotdesk2\gis\Project Data\20.227\20.227.qgz

Figure 2: ASS Risk Mapping and Groundwater Contours

N 0 100 m		PROJECT / REPORT NAME: ACID SULFATE SOIL AND DEWATERING MANAGEMENT PLAN 88 MILL POINT ROAD, SOUTH PERTH	
SCALE: 1:9000	SHEET SIZE: A3 COLOUR	CLIENT: CMW GEOSCIENCES	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: P20.227	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY 08/2020		DRAWN BY / REVIEWED BY: LP / PB	DATE: 8/12/2020

Legend

- Site Boundary
- DWER Historic Groundwater Contours (season maximum, mAHD 2003)
- DWER Historic Groundwater Contours (season minimum, mAHD 2003)

Acid Sulphate Soil Risk Map, Swan Coastal Plain (DER-003)

- High to moderate risk of ASS occurring within 3 m of natural soil surface (and beyond)
- Moderate to low risk of ASS occurring within 3 m of natural soil surface but high to moderate risk of ASS beyond 3 m of natural soil surface

WESTERN ENVIRONMENTAL

\\Hotdesk2\gis\Project Data\20.227\20.227.qgz

Figure 3: Local Sensitive Environments

N 0 250 m		PROJECT / REPORT NAME: ACID SULFATE SOIL AND DEWATERING MANAGEMENT PLAN 88 MILL POINT ROAD, SOUTH PERTH	
SCALE: 1:9000	SHEET SIZE: A3 COLOUR	CLIENT: CMW GEOSCIENCES	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: P20.227	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY 08/2020		DRAWN BY / REVIEWED BY: LP / PB	DATE: 8/12/2020

Legend

- Site Boundary
- 1 km Buffer
- Bush Forever Areas- 2000 (DPLH-019)
- Geomorphic Wetlands Swan Coastal Plain DBCA_019
  - Conservation
  - Multiple Use

WESTERN ENVIRONMENTAL

\\Hotdesk2\gis\Project Data\20.227\20.227.qgz

Figure 4: Surrounding Land Use

N 0 200 m		PROJECT / REPORT NAME: ACID SULFATE SOIL AND DEWATERING MANAGEMENT PLAN 88 MILL POINT ROAD, SOUTH PERTH	
SCALE: 1:7000	SHEET SIZE: A3 COLOUR	CLIENT: CMW GEOSCIENCES	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: P20.227	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY 08/2020		DRAWN BY / REVIEWED BY: LP / PB	DATE: 8/12/2020

Legend

- Site Boundary
- Region Scheme- Zones and Reserves (DPLH-023)
  - Civic and cultural
  - Parks and recreation
  - Primary regional roads
  - Public purposes
  - Urban
  - Waterways

WESTERN ENVIRONMENTAL

\\Hotdesk2\gis\Project Data\20.227\20.227.qgz

391100 391200 391300 391400 391500 391600 391700 391800

6462600 6462500 6462400 6462300 6462200 6462100 6462000 6461900 6461800 6461700

Figure 5: Surrounding Geology and Topography

N 0 100 m		PROJECT / REPORT NAME: ACID SULFATE SOIL AND DEWATERING MANAGEMENT PLAN 88 MILL POINT ROAD, SOUTH PERTH	
SCALE: 1:3000	SHEET SIZE: A3 COLOUR	CLIENT: CMW GEOSCIENCES	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: P20.227	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY 08/2020		DRAWN BY / REVIEWED BY: LP / PB	DATE: 8/12/2020

Legend

- Site Boundary
- Topography Contour (LGATE_140) mAHD

Perth Map Sheet

- C1- CLAY
- LS1- LIMESTONE
- S14- SAND
- S7- SAND
- Water- WATER

WESTERN ENVIRONMENTAL

\\Hotdesk2\gis\Project Data\20.227\20.227.qgz

Figure 6: Proposed Site Layout During Works and Sampling Locations

N

0 5 10 15 m

PROJECT / REPORT NAME: ACID SULFATE SOIL AND DEWATERING MANAGEMENT PLAN 88 MILL POINT ROAD, SOUTH PERTH			
SCALE: 1:500	SHEET SIZE: A3 COLOUR	CLIENT: CMW GEOSCIENCES	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: P20.227	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY 08/2020		DRAWN BY / REVIEWED BY: LP / PB	DATE: 17/12/2020

Legend

- Site Boundary
- Soil Bore
- Pre-existing (non-WEPL) Groundwater Monitoring Well
- Proposed Groundwater Monitoring Well
- Lime Dosing Plant
- Sedimentation Basin
- Infiltration Basin

WESTERN ENVIRONMENTAL

\\Hotdesk2\gis\Project Data\20.227\20.227.qgz

Tables

Table 1
ASS Field Test and SPOCAS Laboratory Results

Field Observations							Field Test				Lab pH		Analytical Results					
Location	Sample ID	Lab ID	SPOCAS Lab ID	Date Sampled	Depth (mbgl)		Analyte	pH_F	pH_{FOX}	pH Δ	Reaction Vigour	pH_{KCl}	pH_{OX}	TAA	TPA	TSA	SPOS	ANCE	Net Acidity (SPOCAS)
							Units	pH	pH	pH	-	pH	pH	%S	%S	%S	%S	%S	%S
							Guideline	<4.0	<3.0	>2	NE	<4.0	<3.0	0.03	0.03	NE	0.03	NE	0.03
					From	To	LOR	-	-	-	-	0.1	0.1	0.005	0.005	0.005	0.005	0.005	0.005
BH01	BH01 0.25	P20-De06958		1/12/2020	0.00	0.25		8.9	7.7	1.20	2								
	BH01 0.5	P20-De06959		1/12/2020	0.25	0.50		9.6	7.5	2.1	2								
	BH01 0.75	P20-De06960		1/12/2020	0.50	0.75		9.7	7.6	2.1	2								
	BH01 1.0	P20-De06961		1/12/2020	0.75	1.00		9.6	7.6	2.0	3								
	BH01 1.25	P20-De06962		1/12/2020	1.00	1.25		9.5	7.5	2.0	3								
	BH01 1.5	P20-De06963		1/12/2020	1.25	1.50		9.6	7.2	2.4	2								
	BH01 1.75	P20-De06964		1/12/2020	1.50	1.75		9.6	7.4	2.2	2								
	BH01 2.0	P20-De06965		1/12/2020	1.75	2.00		9.5	7.6	1.90	2								
	BH01 2.25	P20-De06966		1/12/2020	2.00	2.25		9.4	7.5	1.90	2								
	BH01 2.5	P20-De06967		1/12/2020	2.25	2.50		8.4	5.4	3.0	3								
	BH01 2.75	P20-De06968		1/12/2020	2.50	2.75		7.8	2.9	4.9	2								
	BH01 3.0	P20-De06969		1/12/2020	2.75	3.00		9.2	7.4	1.80	2								
	BH01 3.25	P20-De06970		1/12/2020	3.00	3.25		8.8	5.4	3.4	2								
	BH01 3.5	P20-De06971		1/12/2020	3.25	3.50		7.7	3.0	4.7	2								
	BH01 3.75	P20-De06972		1/12/2020	3.50	3.75		7.5	2.9	4.6	1								
	BH01 4.0	P20-De06973		1/12/2020	3.75	4.00		7.8	2.8	5.0	1								
	BH01 4.25	P20-De06974		1/12/2020	4.00	4.25		8.3	3.4	4.9	2								
	BH01 4.5	P20-De06975		1/12/2020	4.25	4.50		9.8	6.2	3.6	2								
	BH01 4.75	P20-De06976		1/12/2020	4.50	4.75		9.5	6.8	2.7	2								
	BH01 5.0	P20-De06977		1/12/2020	4.75	5.00		6.5	3.4	3.1	2								
	BH 5.25	P20-De06978		1/12/2020	5.00	5.25		9.8	7.8	2.0	2								
	BH01 5.5	P20-De06979		1/12/2020	5.25	5.50		9.4	6.7	2.7	2								
	BH01 5.75	P20-De06980		1/12/2020	5.50	5.75		9.5	6.9	2.6	2								
	BH01 6.0	P20-De06981		1/12/2020	5.75	6.00		9.4	5.5	3.9	2								
	BH01 6.25	P20-De06982		1/12/2020	6.00	6.25		9.6	7.4	2.2	2								

Table 1
ASS Field Test and SPOCAS Laboratory Results

Field Observations							Field Test				Lab pH		Analytical Results					
Location	Sample ID	Lab ID	SPOCAS Lab ID	Date Sampled	Depth (mbgl)		Analyte	pH_F	pH_{FOX}	pH Δ	Reaction Vigour	pH_{KCl}	pH_{OX}	TAA	TPA	TSA	SPOS	ANCE	Net Acidity (SPOCAS)
							Units	pH	pH	pH	-	pH	pH	%S	%S	%S	%S	%S	%S
							Guideline	<4.0	<3.0	>2	NE	<4.0	<3.0	0.03	0.03	NE	0.03	NE	0.03
					From	To	LOR	-	-	-	-	0.1	0.1	0.005	0.005	0.005	0.005	0.005	0.005
BH02	BH02 0.0	P20-De07294		30/11/2020	0.00	0.00		9.4	7.4	2.0	3								
	BH02 0.25	P20-De07295		30/11/2020	0.00	0.25		9.3	7.1	2.2	3								
	BH02 0.5	P20-De07296		30/11/2020	0.25	0.50		9.3	6.9	2.4	2								
	BH02 0.75	P20-De07297		30/11/2020	0.50	0.75		9.5	7.2	2.3	2								
	BH02 1.0	P20-De07298		30/11/2020	0.75	1.00		8.7	6.8	1.9	2								
	BH02 1.25	P20-De07299		30/11/2020	1.00	1.25		8.2	6.8	1.4	3								
	BH02 1.5	P20-De07300		30/11/2020	1.25	1.50		8.4	6.9	1.5	3								
	BH02 1.75	P20-De07301		30/11/2020	1.50	1.75		7.8	5.4	2.4	3								
	BH02 2.0	P20-De07302		30/11/2020	1.75	2.00		8.9	5.5	3.4	3								
	BH02 2.25	P20-De07303		30/11/2020	2.00	2.25		8.9	7.2	1.7	3								
	BH02 2.5	P20-De07304		30/11/2020	2.25	2.50		8.9	6.7	2.2	3								
	BH02 2.75	P20-De07305		30/11/2020	2.50	2.75		7.4	2.7	4.7	4								
	BH02 3.0	P20-De07306		30/11/2020	2.75	3.00		7.5	2.6	4.9	2								
	BH02 3.25	P20-De07307		30/11/2020	3.00	3.25		8	2.6	5.4	2								
	BH02 3.5	P20-De07308		30/11/2020	3.25	3.50		7.7	2.7	5	3								
	BH02 3.75	P20-De07309		30/11/2020	3.50	3.75		7.9	2.7	5.2	3								
	BH02 4.0	P20-De07310		30/11/2020	3.75	4.00		7.4	2.7	4.7	3								
	BH02 4.25	P20-De07311		30/11/2020	4.00	4.25		7.4	2.9	4.5	3								
	BH02 4.5	P20-De07312		30/11/2020	4.25	4.50		7.5	3.1	4.4	2								
	BH02 4.75	P20-De07313		30/11/2020	4.50	4.75		8.5	5.3	3.2	2								
	BH02 5.0	P20-De07314		30/11/2020	4.75	5.00		7.6	2.9	4.7	3								
	BH 5.25	P20-De07315		30/11/2020	5.00	5.25		8	3.5	4.5	2								
	BH02 5.5	P20-De07316		30/11/2020	5.25	5.50		7.4	3	4.4	2								
	BH02 5.75	P20-De07317		30/11/2020	5.50	5.75		7.3	2.8	4.5	2								
	BH02 6.0	P20-De07318		30/11/2020	5.75	6.00		7.1	2.7	4.4	2								

Table 1
ASS Field Test and SPOCAS Laboratory Results

Field Observations							Field Test				Lab pH		Analytical Results					
Location	Sample ID	Lab ID	SPOCAS Lab ID	Date Sampled	Depth (mbgl)		Analyte	pH_F	pH_{FOX}	pH Δ	Reaction Vigour	pH_{KCl}	pH_{OX}	TAA	TPA	TSA	SPOS	ANCE	Net Acidity (SPOCAS)
							Units	pH	pH	pH	-	pH	pH	%S	%S	%S	%S	%S	%S
							Guideline	<4.0	<3.0	>2	NE	<4.0	<3.0	0.03	0.03	NE	0.03	NE	0.03
					From	To	LOR	-	-	-	-	0.1	0.1	0.005	0.005	0.005	0.005	0.005	0.005
BH03	BH03 0.0	P20-De08623		2/12/2020	0.00	0.00		9.3	7.4	1.9	3								
	BH03 0.25	P20-De08624	P20-De21869	2/12/2020	0.00	0.25		9.3	7.4	1.9	3	9.1	7.7	< 0.003	< 0.02	< 0.02	< 0.02	5.8	< 0.02
	BH03 0.5	P20-De08625		2/12/2020	0.25	0.50		8.9	7.1	1.8	2								
	BH03 0.75	P20-De08626		2/12/2020	0.50	0.75		8.5	7.1	1.4	2								
	BH03 1.0	P20-De08627	P20-De21870	2/12/2020	0.75	1.00		9	7.1	1.9	2	9.1	7.2	< 0.003	< 0.02	< 0.02	< 0.02	0.31	< 0.02
	BH03 1.25	P20-De08628		2/12/2020	1.00	1.25		9	7.4	1.6	2								
	BH03 1.5	P20-De08629		2/12/2020	1.25	1.50		8.9	7.3	1.6	2								
	BH03 1.75	P20-De08630		2/12/2020	1.50	1.75		8.7	7.3	1.4	2								
	BH03 2.0	P20-De08631		2/12/2020	1.75	2.00		8	6.6	1.4	1								
	BH03 2.25	P20-De08632		2/12/2020	2.00	2.25		7.8	6.5	1.3	1								
	BH03 2.5	P20-De08633		2/12/2020	2.25	2.50		7.6	6.5	1.1	1								
	BH03 2.75	P20-De08634		2/12/2020	2.50	2.75		7.1	6	1.1	1								
	BH03 3.0	P20-De08635		2/12/2020	2.75	3.00		6.8	4.8	2.0	2								
	BH03 3.25	P20-De08636		2/12/2020	3.00	3.25		7.4	6.4	1.0	2								
	BH03 3.5	P20-De08637		2/12/2020	3.25	3.50		7.4	5.9	1.5	1								
	BH03 3.75	P20-De08638		2/12/2020	3.50	3.75		7.2	5.6	1.6	1								
	BH03 4.0	P20-De08639		2/12/2020	3.75	4.00		7	5.7	1.3	1								
	BH03 4.25	P20-De08640		2/12/2020	4.00	4.25		7	5.5	1.5	1								
	BH03 4.5	P20-De08641		2/12/2020	4.25	4.50		6.9	5.5	1.4	1								
	BH03 4.75	P20-De08642		2/12/2020	4.50	4.75		7.2	6	1.2	1								
	BH03 5.0	P20-De08643		2/12/2020	4.75	5.00		7.5	6	1.5	2								
	BH 5.25	P20-De08644		2/12/2020	5.00	5.25		7	5.1	1.9	1								
	BH03 5.5	P20-De08645		2/12/2020	5.25	5.50		7	5.1	1.9	1								
	BH03 5.75	P20-De08646		2/12/2020	5.50	5.75		7.1	4.7	2.4	2								
	BH03 6.0	P20-De08647	P20-De21871	2/12/2020	5.75	6.00		7.2	4.5	2.7	2	5.9	5.3	< 0.003	< 0.02	< 0.02	< 0.02	n/a	< 0.02

WESTERN ENVIRONMENTAL

Table 1
ASS Field Test and SPOCAS Laboratory Results

Field Observations							Field Test				Lab pH		Analytical Results					
Location	Sample ID	Lab ID	SPOCAS Lab ID	Date Sampled	Depth (mbgl)		Analyte	pH_F	pH_{FOX}	pH Δ	Reaction Vigour	pH_{KCl}	pH_{OX}	TAA	TPA	TSA	SPOS	ANCE	Net Acidity (SPOCAS)
							Units	pH	pH	pH	-	pH	pH	%S	%S	%S	%S	%S	%S
							Guideline	<4.0	<3.0	>2	NE	<4.0	<3.0	0.03	0.03	NE	0.03	NE	0.03
					From	To	LOR	-	-	-	-	0.1	0.1	0.005	0.005	0.005	0.005	0.005	0.005
BH04	BH04 0.0	P20-De08656		2/12/2020	0.00	0.00		9.1	7	2.1	3								
	BH04 0.25	P20-De08657		2/12/2020	0.00	0.25		9.4	7.4	2.0	3								
	BH04 0.5	P20-De08658	P20-De21872	2/12/2020	0.25	0.50		9.1	6.9	2.2	3	9.1	7.5	< 0.003	< 0.02	< 0.02	< 0.02	0.58	< 0.02
	BH04 0.75	P20-De08659		2/12/2020	0.50	0.75		9.1	6.7	2.4	3								
	BH04 1.0	P20-De08660		2/12/2020	0.75	1.00		8.6	6	2.6	2								
	BH04 1.25	P20-De08661		2/12/2020	1.00	1.25		9	6.6	2.4	2								
	BH04 1.5	P20-De08662		2/12/2020	1.25	1.50		8.8	6.3	2.5	2								
	BH04 1.75	P20-De08663		2/12/2020	1.50	1.75		6	4.1	1.9	2								
	BH04 2.0	P20-De08664	P20-De21873	2/12/2020	1.75	2.00		5.5	2.9	2.6	2	5.7	4.3	0.01	< 0.02	< 0.02	< 0.02	n/a	< 0.02
	BH04 2.25	P20-De08665		2/12/2020	2.00	2.25		6.5	3.4	3.1	2								
	BH04 2.5	P20-De08666		2/12/2020	2.25	2.50		6.4	2.8	3.6	3								
	BH04 2.75	P20-De08667		2/12/2020	2.50	2.75		6	2.7	3.3	4								
	BH04 3.0	P20-De08668	P20-De21874	2/12/2020	2.75	3.00		5.5	2.6	2.9	4	5	2.7	0.02	0.13	0.12	0.12	n/a	0.14
	BH04 3.25	P20-De08669		2/12/2020	3.00	3.25		6.5	3.1	3.4	2								
	BH04 3.5	P20-De08670		2/12/2020	3.25	3.50		6.4	2.6	3.8	2								
	BH04 3.75	P20-De08671		2/12/2020	3.50	3.75		6.1	2.1	4.0	4								
	BH04 4.0	P20-De08672		2/12/2020	3.75	4.00		5.6	2.5	3.1	2								
	BH04 4.25	P20-De08673		2/12/2020	4.00	4.25		5.4	2.5	2.9	1								
	BH04 4.5	P20-De08674		2/12/2020	4.25	4.50		6.5	2.5	4.0	1								
	BH04 4.75	P20-De08675	P20-De21875	2/12/2020	4.50	4.75		6.4	2.9	3.5	2	5.6	4	< 0.003	< 0.02	< 0.02	< 0.02	n/a	< 0.02
	BH04 5.0	P20-De08676		2/12/2020	4.75	5.00		6.5	2.9	3.6	2								
	BH 5.25	P20-De08677		2/12/2020	5.00	5.25		6.7	3	3.7	2								
	BH04 5.5	P20-De08678		2/12/2020	5.25	5.50		6.2	3	3.2	2								
	BH04 5.75	P20-De08679	P20-De21876	2/12/2020	5.50	5.75		5.2	2.8	2.4	2	5.5	3.7	0.01	0.02	< 0.02	< 0.02	n/a	< 0.02
	BH04 6.0	P20-De08680		2/12/2020	5.75	6.00		6.2	2.9	3.3	2								

Notes:
NE = Regulatory guideline not established
< Indicates sample results below the laboratory limit of reporting (LOR)
- Not Analysed
mbgl = metres below ground level
Reaction Vigour = 1; No reaction to slight. 2; Moderate reaction. 3; Strong reaction with persistent froth. 4; Extreme reaction.
n/a - Acid Neutralising capacity, reached before this analysis began. No need to analysis, below LOR.
Net acidity - (TAA + SPOS) is calculated by applying half any reported LOR value
ANCE - Sulfidic Ca + Sulfidic Mg
Regulatory Guidelines:
Guidelines are derived from the Department of Environment Regulation (2015) Identification and Investigation of Acid Sulfate Soils and Acidic Landscapes.
Field test value indicative of ASS
Field test value indicative of PASS
shading indicates sample exceeds DER ASS Action Criteria of 0.03 %S or 18.7 mol H^+/tonne, for excavations > 1,000 tonnes

WESTERN ENVIRONMENTAL

Table 2
Soil Analytical Results - Metals

				Heavy Metals							
				Arsenic	Cadmium	Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc
EIL - Urban residential and POS				**100**	NE	NE	**60**	**1,100**	NE	**30**	**70**
HIL-B (Residential B)				**500**	**150**	NE	**30,000**	**1,200**	**120**	**1,200**	**60,000**
LOR				**2**	**0.4**	**5**	**5**	**5**	**0.1**	**5**	**5**
Sample ID	**Lab ID**	**Sample Depth (m)**	**Date Sampled**								
BH01_0.0	P20-De06958	0	25/11/2020	**3.5**	< 0.4	**10**	< 5	< 5	< 0.1	< 5	**8.2**
BH01_0.5	P20-De06960	0.5	25/11/2020	< 2	< 0.4	**12**	< 5	**30**	< 0.1	< 5	**29**
BH02_0.0	P20-De07294	0	30/11/2020	< 2	< 0.4	**6.6**	**5.5**	**31**	< 0.1	< 5	**49**
BH02_0.5	P20-De07296	0.5	30/11/2020	< 2	< 0.4	< 5	**11**	**15**	< 0.1	< 5	**29**
BH03_0.0	P20-De08623	0	2/12/2020	< 2	< 0.4	**13**	< 5	**16**	< 0.1	< 5	**19**
BH03_0.5	P20-De08625	0.5	2/12/2020	< 2	< 0.4	< 5	< 5	**6.9**	< 0.1	< 5	**95**
BH04_0.0	P20-De08656	0	2/12/2020	< 2	< 0.4	**5.8**	< 5	**15**	< 0.1	< 5	**16**
BH04_0.5	P20-De08658	0.5	2/12/2020	< 2	< 0.4	**18**	< 5	**8.7**	< 0.1	**5.1**	< 5

Notes:

NE = Regulatory guideline not established

< Indicates sample results below the laboratory limit of reporting (LOR)

- Not Analysed

Regulatory Guidelines:

Guidelines are derived from the *National Environment Protection (Assessment of Site Contamination) Measure* (NEPC, 2013) and the *Assessment and Management of Contaminated Sites* (DER, 2014).

shading indicates concentration exceeds the NEPC (2013) Ecological Investigation Levels (EIL)

shading indicates concentration exceeds the NEPC (2013) Health Investigation Levels (HIL)

WESTERN ENVIRONMENTAL

Table 3
Soil Analytical Results - Organochlorine Pesticides

				Organochlorine Pesticides																
				p,p-DDD	p,p-DDE	p,p-DDT	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	d-BHC	DDT + DDE + DDD	Dieldrin	Endosulfan Sulfate	Endrin	Endrin Ketone	Lindane	Heptachlor Epoxide	Hexachlorobenzene	Methoxychlor
EIL - Urban residential and POS				NE	NE	180	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
HIL-B (Residential B)				NE	NE	NE	NE	NE	10	NE	90	NE	600	NE	NE	20	NE	NE	NE	15	500
LOR				0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Sample ID	**Lab ID**	**Sample Depth (m)**	**Date Sampled**	mg/kg																	
BH01_0.0	P20-De06958	0	25/11/2020	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
BH01_0.5	P20-De06960	0.5	25/11/2020	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
BH02_0.0	P20-De07294	0	30/11/2020	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
BH02_0.5	P20-De07296	0.5	30/11/2020	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
BH03_0.0	P20-De08623	0	2/12/2020	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
BH03_0.5	P20-De08625	0.5	2/12/2020	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
BH04_0.0	P20-De08656	0	2/12/2020	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
BH04_0.5	P20-De08658	0.5	2/12/2020	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Notes:

NE = Regulatory guideline not established

< Indicates sample results below the laboratory limit of reporting (LOR)

- Not Analysed

Regulatory Guidelines:

Guidelines are derived from the *National Environment Protection (Assessment of Site Contamination) Measure* (NEPC, 2013) and the *Assessment and Management of Contaminated Sites* (DER, 2014).

shading indicates concentration exceeds the NEPC (2013) Ecological Investigation Levels (EIL)

shading indicates concentration exceeds the NEPC (2013) Health Investigation Levels (HIL)

WESTERN ENVIRONMENTAL

Table 4
Soil Analytical Results - Monocyclic Aromatic Hydrocarbons, Total Petroleum Hydrocarbons, & Total Recoverable Hydrocarbons

				BTEX							TRH											
				Benzene	Ethylbenzene	m+p-Xylene	o-Xylene	Toluene	Naphthalene	Benzo(a)pyrene	C_{10} - C_{14}	C_{10} - C_{36} (Total)	C_{15} - C_{28}	C_{29} - C_{36}	C_6 - C_9	TRH >C_{10} - C_{16}	TRH >C_{10} - C_{16} less N (F2)	C_{10} - C_{40} (Total)	TRH >C_{16} - C_{34} (F3)	TRH >C_{34} - C_{40} (F4)	C_6 - C_{10} less BTEX (F1)	C_6 - C_{10}
EIL - Urban residential and POS				NE	NE	NE		NE	170	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
ESL - Urban residential & POS	**coarse soil**			50	70	105		85	NE	0.7	NE	NE	NE	NE	NE	NE	120	NE	300	2,800	180	NE
	fine soil			65	125	45		105	NE	0.7	NE	NE	NE	NE	NE	NE	120	NE	1,300	5,600	180	NE
Direct Contact - HSL-B Residential (High Density)				140	5,900	17,000		21,000	2,200	NE	NE	NE	NE	NE	NE	NE	4,200	NE	5,800	8,100	5,600	NE
Direct Contact - HSL Intrusive Maintenance Worker				1,100	85,000	130,000		120,000	29,000	NE	NE	NE	NE	NE	NE	NE	62,000	NE	85,000	120,000	82,000	NE
Vapour Intrusion - HSL A&B (Low-high density residential)	**Sand (0 - <1 m)**			0.5	55	40		160	3	NE	NE	NE	NE	NE	NE	NE	110	NE	NE	NE	45	NE
Vapour Intrusion - HSL (Intrusive Maintenance Worker)	**Sand (0 - <2 m)**			77	NL	NL		NL	NL	NE	NE	NE	NE	NE	NE	NE	NL	NE	NE	NE	NL	NE
LOR				0.1	0.1	0.2	0.1	0.1	0.5	0.5	20	50	50	50	20	20	50	100	100	100	20	20
Sample ID	**Lab ID**	**Sample Depth (m)**	**Date Sampled**	mg/kg																		
BH01_0.0	P20-De06958	0	25/11/2020	< 0.1	< 0.1	< 0.2	< 0.1	< 0.1	< 0.5	< 0.5	< 20	< 50	< 50	< 50	< 20	< 20	< 50	< 100	< 100	< 100	< 20	< 20
BH01_0.5	P20-De06960	0.5	25/11/2020	< 0.1	< 0.1	< 0.2	< 0.1	< 0.1	< 0.5	< 0.5	< 20	< 50	< 50	< 50	< 20	< 20	< 50	< 100	< 100	< 100	< 20	< 20
BH02_0.0	P20-De07294	0	30/11/2020	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 1	< 1	< 20	< 50	< 50	< 50	<40	<40	< 50	< 100	< 100	< 100	<40	<40
BH02_0.5	P20-De07296	0.5	30/11/2020	< 0.1	< 0.1	< 0.2	< 0.1	< 0.1	< 0.5	< 0.5	< 20	< 50	< 50	< 50	< 20	< 20	< 50	< 100	< 100	< 100	< 20	< 20
BH03_0.0	P20-De08623	0	2/12/2020	< 0.1	< 0.1	< 0.2	< 0.1	< 0.1	< 0.5	< 0.5	< 20	< 50	< 50	< 50	< 20	< 20	< 50	< 100	< 100	< 100	< 20	< 20
BH03_0.5	P20-De08625	0.5	2/12/2020	< 0.1	< 0.1	< 0.2	< 0.1	< 0.1	< 0.5	< 0.5	< 20	< 50	< 50	< 50	< 20	< 20	< 50	< 100	< 100	< 100	< 20	< 20
BH04_0.0	P20-De08656	0	2/12/2020	< 0.1	< 0.1	< 0.2	< 0.1	< 0.1	< 0.5	< 0.5	< 20	< 50	< 50	< 50	< 20	< 20	< 50	< 100	< 100	< 100	< 20	< 20
BH04_0.5	P20-De08658	0.5	2/12/2020	< 0.1	< 0.1	< 0.2	< 0.1	< 0.1	< 0.5	< 0.5	< 20	< 50	< 50	< 50	< 20	< 20	< 50	< 100	< 100	< 100	< 20	< 20

Notes:
NE = Regulatory guideline not established
NL = Not limiting
< Indicates sample results below the laboratory limit of reporting (LOR)
- Not Analysed

Regulatory Guidelines:
Guidelines are derived from the *National Environment Protection (Assessment of Site Contamination) Measure (NEPC, 2013), the Assessment and Management of Contaminated Sites (DER, 2014) and CRC CARE Technical Report No. 10 (2011)* .

shading indicates concentration exceeds the NEPC (2013) Ecological Investigation Levels (EIL)
shading indicates concentration exceeds the NEPC (2013) Ecological Screening Levels (ESL)
shading indicates concentration exceeds the CRC CARE Health Screening Levels (HSL) for Direct Contact
shading indicates concentration exceeds the CRC CARE Health Screening Levels (HSL) for Vapour Intrusion for Sand

Table 5
Soil Analytical Results - Polycyclic Aromatic Hydrocarbons

				PAHs																
				Acenapthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a)pyrene	Benzo(a)pyrene TEQ	Benzo(b+j) fluoranthene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d) pyrene	Naphthalene	Phenanthrene	Pyrene	Total PAHs
EIL - Urban residential & POS				**NE**	**NE**	NE	NE	NE	**NE**	**NE**	**NE**	**NE**	NE	**NE**	NE	**NE**	**NE**	**170**	**NE**	NE	**NE**
ESL - Urban residential & POS	**coarse soil**			NE	NE	NE	NE	**0.7**	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
	fine soil			NE	NE	NE	NE	**0.7**	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
HIL-B (Residential B)				NE	NE	NE	NE	NE	**4**	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	**400**
Direct Contact - HSL-B Residential (High Density)				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	**2,200**	NE	NE	NE
Direct Contact - HSL - Intrusive Maintenance Worker				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	**29,000**	NE	NE	NE
Vapour Intrusion - HSL A&B (Low-high density residential)	**Sand (0 - <1 m)**			NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	**3**	NE	NE	NE
Vapour Intrusion - HSL (Intrusive Maintenance Worker)	**Sand (0 - <2 m)**			NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	**NL**	NE	NE	NE
	LOR			**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
Sample ID	**Lab ID**	**Sample Depth (m)**	**Date Sampled**	**mg/kg**																
BH01_0.0	P20-De06958	0	25/11/2020	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
BH01_0.5	P20-De06960	0.5	25/11/2020	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
BH02_0.0	P20-De07294	0	30/11/2020	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
BH02_0.5	P20-De07296	0.5	30/11/2020	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
BH03_0.0	P20-De08623	0	2/12/2020	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
BH03_0.5	P20-De08625	0.5	2/12/2020	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
BH04_0.0	P20-De08656	0	2/12/2020	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
BH04_0.5	P20-De08658	0.5	2/12/2020	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

Notes:

NE = Regulatory guideline not established

NL = Not limiting

< Indicates sample results below the laboratory limit of reporting (LOR)

- Not Analysed

Regulatory Guidelines:

Guidelines are derived from the *National Environment Protection (Assessment of Site Contamination) Measure (NEPC, 2013), the Assessment and Management of Contaminated Sites (DER, 2014) and CRC CARE Technical Report No. 10 (2011)* .

shading indicates concentration exceeds the NEPC (2013) Ecological Investigation Levels (EIL)

shading indicates concentration exceeds the NEPC (2013) Ecological Screening Levels (ESL)

shading indicates concentration exceeds the NEPC (2013) Health Investigation Levels (HIL)

shading indicates concentration exceeds the CRC CARE Health Screening Levels (HSL) for Direct Contact

shading indicates concentration exceeds the CRC CARE Health Screening Levels (HSL) for Vapour Intrusion for Sand

WESTERN ENVIRONMENTAL

Table 6
Groundwater Analytical Results

	FWG	MWG	NPUG	Water Corp Trade Waste Criteria	ASS	Sample ID		BH3	BH4	DUP01	RPD %
						Lab ID		P20-De20019	P20-De20020	P20-De20021	
						Date Sampled		9/12/2020	9/12/2020	9/12/2020	
						Units	LOR				
Dissolved Metals											
Aluminium	0.055	NE	0.2	100	1.0[4] / 0.15[5]	mg/L	0.05	< 0.05	< 0.05	< 0.05	#
Arsenic (III)	0.024	NE	0.1	1	NE	mg/L	0.001	< 0.001	< 0.001	< 0.001	#
Cadmium	0.0002	0.0007	0.02	1	NE	mg/L	0.0002	< 0.0002	< 0.0002	< 0.0002	#
Chromium (VI)	0.001	0.0044	0.5	3	NE	mg/L	0.001	< 0.001	< 0.001	< 0.001	#
Iron	NE	NE	NE	10	1.0[5]	mg/L	0.05	< 0.05	< 0.05	< 0.05	#
Managanese	1.9	NE	5	NE	NE	mg/L	0.0001	0.11	0.078	0.082	5.0
Nickel	0.011	0.007	0.2	3	NE	mg/L	0.001	0.003	0.004	0.004	0.0
Selenium	0.005^	NE	0.1^	1	NE	mg/L	0.001	< 0.001	< 0.001	< 0.001	#
Zinc	0.008	0.015	3	3	NE	mg/L	0.005	0.025	0.016	0.015	6.5
Total Metals											
Aluminium	NE	NE	NE	NE	0.15[5]	mg/L	0.05	0.34	< 0.05	0.09	#
Copper	NE	NE	NE	5	NE	mg/L	0.001	0.002	-	-	-
Iron	0.3	1	0.3	NE	1.0[5]	mg/L	0.001	0.12	0.09	0.1	10.5
Lead	NE	NE	NE	1	NE	mg/L	0.001	0.002	-	-	-
Mercury	NE	NE	NE	0.01	NE	mg/L	0.0001	< 0.0001	-	-	-
Molybdenum	NE	NE	NE	5	NE	mg/L	0.005	0.076	-	-	-
Silver	NE	NE	NE	5	NE		0.005	< 0.005	-	-	-
Lab											
pH	6.5-8.5[1]	8-8.4	NE	6.0-10.0	<5	pH units	0.1	7.9	7.4	7.4	0.0
Electrical Conductivity	300-1,500[2]	NE	NE	NE	NE	µs/cm	10	710	580	590	1.7
Acid Sulfate Soil Parameters											
Acidity (as CaCO3)	NE	NE	NE	NE	>40	mg/L	10	< 10	< 10	< 10	#
Alkalinity (total) as CaCO3	NE	NE	NE	NE	NE	mg/L	20	73	62	63	1.6
Sulphate	NE	NE	1,000	600	NE	mg/L	5	10	18	16	11.8
Chloride	NE	NE	250	NE	NE	mg/L	1	190	180	150	18.2
TDS	NE	NE	NE	NE	NE	mg/L	10	410	320	310	3.2
TSS				1,500		mg/L	1	12	-	-	-
ASS Ratios											
Alkalinity : Sulphate	NE	NE	NE	NE	<5	-	-	7.30	3.44	3.94	13.4
Acidity : Alkalinity	NE	NE	NE	NE	>1	-	-	#	#	#	#
Chloride : Sulphate	NE	NE	NE	NE	<2	-	-	19.00	10.00	9.38	6.5
Nutrients											
Total Phosphorus	0.1[6]	NE	NE	NE	NE	mg/L	0.01	0.01	< 0.01	< 0.01	#
Phosphorous filterable reactive	NE	NE	NE	NE	NE	mg/L	0.01	< 0.01	0.11	< 0.01	#
Total Nitrogen	1[6]	NE	NE	NE	NE	mg/L	0.2	< 0.2	< 0.2	< 0.2	#
NOx-N [Nitrate & Nitrite (as N)]	0.1[1]	NE	NE	NE	NE	mg/L	0.05	< 0.05	< 0.05	0.08	#
Total Kjeldahl Nitrogen	NE	NE	NE	NE	NE	mg/L	0.2	< 0.2	< 0.2	< 0.2	#
Ammonia (as NH_3-N)	0.9	0.91	NE	200 (pH < 8)	NE	mg/L	0.01	0.06	0.1	0.1	#
Sodium (Dissolved)	NE	NE	NE	NE	NE	mg/L	0.5	100	75	75	0
Biochemical Oxygen Demand (BOD)	NE	NE	NE	3,000	NE	mg/L	5	< 5	-	-	-
Oil & Grease	NE	NE	NE	500	NE	mg/L	10	< 10	-	-	-

Notes:
NE = Regulatory guideline not established
[1] value derived from ANZECC (2000) - wetland ecosystems in South-west Australia
[2] value derived from ANZECC (2000) - lakes, reservoirs & wetland ecosystems in South-west Australia
[4] guideline value is an indicator of ASS (for baseline monitoring)
[5] guideline value is limiting criteria for discharge to sensitive aquatic ecosystems (for effluent monitoring)
[6] value derived from SRT (2008) Healthy Rivers Action Plan
^ indicates total guideline value
< Indicates sample results below the laboratory limit of reporting (LOR)
- Not Analysed
# indicates RPD not calculable, as primary and replicate concentrations <LOR.
Red font indicates RPD > 30%

Regulatory Guidelines:
Guidelines derived from DER (2014) *Assessment and management of contaminated sites - Contaminated sites guidelines, DER (2015) Identification and investigation of acid sulfate soils and acidic landscapes,*
NEPC (2013) *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1),*
NHMRC & NRMMC (2011) *Australian Drinking Water Guidelines* and ANZECC & ARMCANZ (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.*

shading indicates concentration exceeds the FWG (Fresh Water Guidelines for slightly - moderately disturbed systems).
shading indicates concentration exceeds the MWG (Marine Water Guidelines for slightly - moderately disturbed systems).
shading indicates concentration exceeds the NPUG (Non-Potable Groundwater Use - Department of Health, 2014).
shading indicates concentrations exceeds the Water Corporation (Trade Waste Acceptance Criteria).
shading indicates concentration exceeds the ASS indicator Guideline (Department of Environment Regulation, 2015).

Appendix A
Site and Development Information

Memo

Stantec

Structural Concept Memo 002

Enquiries: Eric Le Meur

Project No: 301248278

To: Achilles Limbouris

Cc: Mark Jeavons, Damian Fasher, Thomas Willday, Jeff Gidman, David Smyth, John O'Gorman, Alex Jones

From: Eric Le Meur Date: 16 Nov 2020

Subject: 88 Mill Point Road
Preliminary Structural Concept

Hello Achilles,

Please find attached preliminary structural concept mark-up based on the architectural work in progress drawings dated 12/11/2020 and our recent discussion for your review.

This structural concept is based on the following assumptions:

- Latest floor-to-floor height shown on the architectural section drawing
- Header beams depth across all structural openings of structural walls as per recent discussion (refer mark-up attached)
- PT and RC slab options on typical apartment floors
- Assumed FRL (mins):
  - Carpark – 120/120/120
  - Common area/Commercial – 180/180/180
  - Residential – 90/90/90
- Assumed maximum wet area set-down = 30mm
- Assumed maximum balcony set-down = 100mm

The lateral building acceleration response (occupant comfort under wind) is currently on the limit. This is typically addressed by the use of a roof-mounted damper, however this can only be confirmed once the detailed wind tunnel study has been completed. A provisional allowance for a damper may be worth noting as part of your cost estimates. We are seeking further guidance from the wind consultant on this.

Regards,

Stantec Australia Pty Ltd

Eric Le Meur
Principal, Senior Structural Project Engineer

88 Mill Point Road, South Perth

Preliminary
Structural Concept

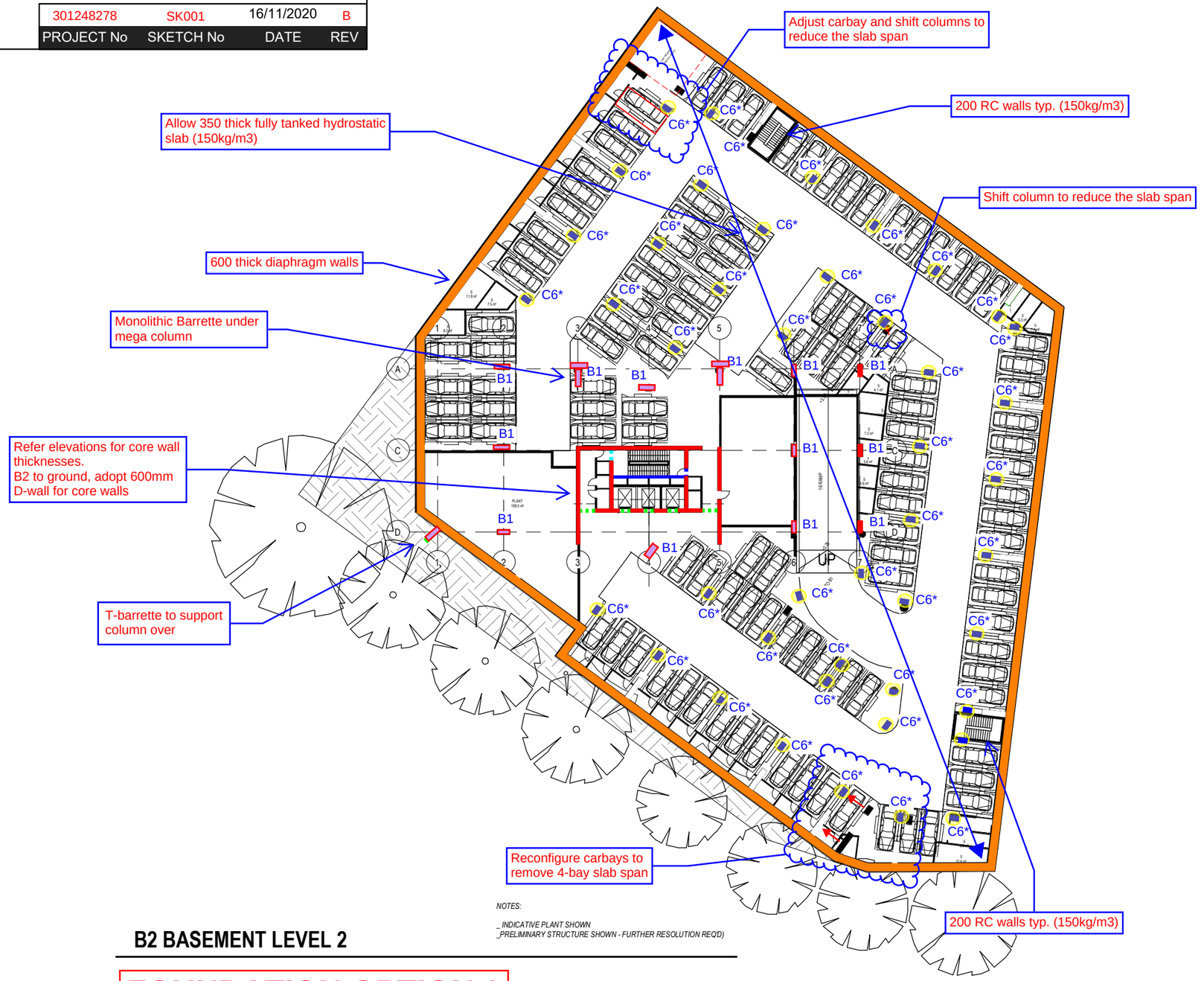
DOCUMENTATION ACKNOWLEDGEMENTS:

ALL PARTIES ACKNOWLEDGE AND AGREE THAT ANY DESIGN DOCUMENTS PROVIDED HEREWITH ARE CONCEPT LEVEL ONLY.
DOCUMENTS FOR ECI ESTIMATING PURPOSES ONLY AND MAY NOT REFLECT THE FULL SCOPE ULTIMATELY REFLECTED ON FINAL DRAWINGS. THE CLIENT AND /OR ECI CONTRACTOR IS RESPONSIBLE, THROUGH AS-REQUIRED INTERACTION WITH THE CONSULTANT, FOR INFORMING THEMSELVES OF THE DESIGN STATUS AS REFLECTED ON THE PARTIAL DOCUMENTS PRIOR TO FORMALIZING A PRICE (“DUE DILIGENCE PROCESS”). THE CLIENT AND /OR ECI CONTRACTOR MUST AFFORD THE CONSULTANT WITH THE OPPORTUNITY TO PROVIDE INSIGHT INTO THE DESIGN STATUS REFLECTED ON PARTIAL DOCUMENTS IF THE CLIENT AND /OR ECI CONTRACTOR IS TO SEEK TO RELY ON PRICING FROM SUCH DOCUMENTS. IT IS THEN THE CLIENT AND /OR ECI CONTRACTOR'S RESPONSIBILITY TO INCORPORATE CONTINGENCIES WITHIN THE FORMAL PRICE TO COMMERCIALLY MANAGE THE RISK ASSOCIATED WITH ANY INCOMPLETE AREAS AS DETERMINED DURING THE PRE-PRICING DUE DILIGENCE PROCESS. THE CONTINGENCIES ALLOWED SHALL I) REFLECT THE ECI CONTRACTOR'S INFORMED UNDERSTANDING OF THE STATUS OF PARTIAL DOCUMENTS FOLLOWING THE DUE-DILIGENCE PROCESS AND II) COMMERCIALLY MANAGE REASONABLE AND CONVENTIONAL COST OVER-RUN RISK BEYOND THIS STATUS.

Stantec

SKETCH TITLE
88 Mill Point Road - preliminary structural concept

PROJECT No	SKETCH No	DATE	REV
301248278	SK001	16/11/2020	B



B2 BASEMENT LEVEL 2

FOUNDATION OPTION 1
FULL TOP-DOWN

NOTES:
1) This concept is based on architectural WIP drawings dated 12/11/2020.
2) Assumed FRL(mins):
   Carpark - 120/120/120
   Common area - 180/180/180
   Residential - 90/90/90
3) Assumed 30mm max setdown to wet areas.
4) PT and RC rates provided are based on prelim design and are approximate only - include trimmers, hairpins, cogs and antiburst (excl lapping) - to be used for cost estimating purposes only. Additional allowance of 30kg/m to be made for all folds to balcony setdowns on typical slabs. Final design to be undertaken by specialist PT contractor - Thickness and PT/RC rates may vary from what is shown herewith.
5) Concrete grade to all suspended slabs to be N40 UNO.

COLUMN SCHEDULE
***All columns above and below assumed to have centroid aligned**
***Allow 600-800mm deep capital where column profile and/or orientation changes at transition.**

TOWER COLUMNS
B2 to underside L12:
N80/N65 concrete typically UNO
- C1 - 750 dia circular column (reo rates allow 170kg/m3)
- C2 - 1400x550 column (reo rates allow 200kg/m3)
- C3 - 2000x500 megacolumn (N80, reo rates allow 170kg/m3)
- C4 - 800x800 column (reo rates allow 180kg/m3)
- C5 - 1500x600 column (reo rates allow 180kg/m3)
- B1 - Barette Column 1500x600 column - extends to ground level (reo rates allow 180kg/m3) - Depth TBC by CMW. Design load 21MN

L12 to underside L24:
N65/N50 concrete typically UNO
- C1 - 550 dia circular column (reo rates allow 150kg/m3)
- C2 - 1400x350 column (reo rates allow 180kg/m3)
- C3 - (i) L12 to underside L20 - 2000x500 megacolumn (N80, reo rates allow 170kg/m3)
  (ii) L20 to underside L24 - 1400x300 column (reo rates allow 170kg/m3)
- C4 - 650x650 column (reo rates allow 180kg/m3)
- C5 - 1400x450 column (reo rates allow 180kg/m3)

L24 to Roof:
N50/N40 concrete typically UNO
- C1 - 400 dia circular column (reo rates allow 150kg/m3)
- C2 - 1200x275 column (reo rates allow 160kg/m3)
- C3 - 1200x275 column (reo rates allow 160kg/m3)
- C4 - 450x450 column (reo rates allow 220kg/m3)
- C5 - 1200x300 column (reo rates allow 150kg/m3)

PODIUM/CARPARK COLUMNS

C6 - 1000x400 carpark columns

C6* - 1000x400 carpark columns and allow for 200UC steel plunge columns

- Buttress barrette for lateral restraint to Doughnut slab - Refer CMW for depth.

Tower Barrette Piles - Refer CMW for depth - Refer foundation loading plan

900mm bored piled + pilecap (1.5x1.5x0.8m) - below B2. Depth to be confirmed by CWM. Design load 5MN (service load)

H

CONSULTANT
Hassell
Hassell LTD ABN 24 007 711 435
Level 1
Commonwealth Bank Building
242 Murray Street
Perth WA 6000 Australia
T +61 8 6477 6000
perth@hassellstudio.com

REFERENCE

NORTH

0m 5m 10m 15m 20m

NOTES
1. Do not scale drawing. Written dimensions govern
2. All dimensions are in millimeters unless noted otherwise
3. All dimensions shall be verified on site before proceeding with the work. Hassell shall be notified in writing of any discrepancies.
4. This drawing must be read in conjunction with all relevant contracts, specifications and drawings

This drawing is an uncontrolled copy. Unless noted otherwise

REV DESCRIPTION **DATE**

CLIENT
ZONE Q

PROJECT
88 MILL POINT ROAD
SOUTH PERTH
WESTERN AUSTRALINA

STATUS

DRAWING TITLE
BASEMENT 02

REVIEWED
Checker

APPROVED
Approver

DRAWING NO.
XX_098

SCALE @ A3
1 : 500

PROJECT NO.
015032

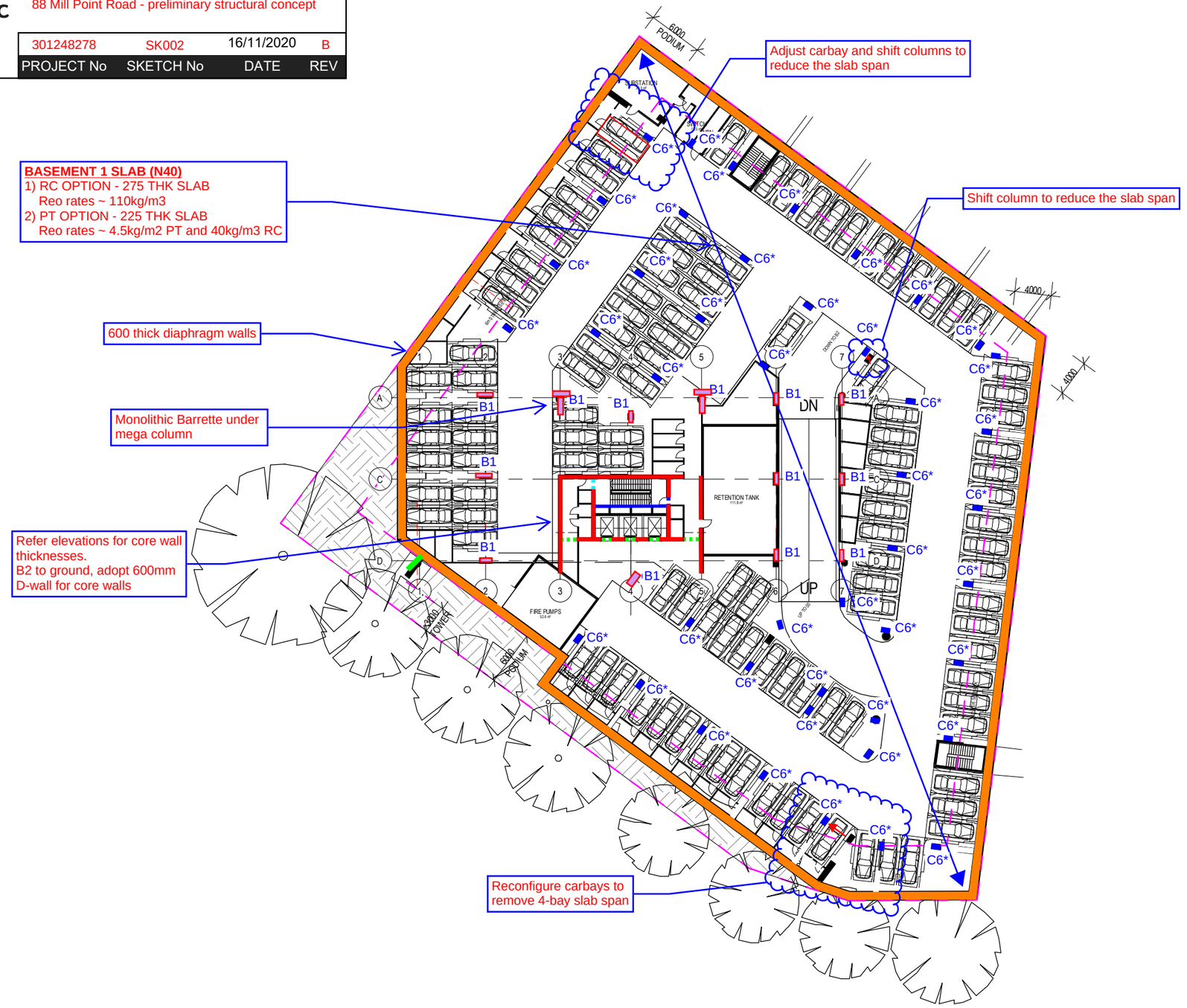
REV NO.

Stantec

SKETCH TITLE

88 Mill Point Road - preliminary structural concept

PROJECT No	SKETCH No	DATE	REV
301248278	SK002	16/11/2020	B



B1 BASEMENT LEVEL 1

FOUNDATION OPTION 1
FULL TOP-DOWN

NOTES:
1) This concept is based on architectural WIP drawings dated 12/11/2020.
2) Assumed FRL(mins):
   Carpark - 120/120/120
   Common area - 180/180/180
   Residential - 90/90/90
3) Assumed 30mm max setdown to wet areas.
4) PT and RC rates provided are based on prelim design and are approximate only - include trimmers, hairpins, cogs and antiburst (excl lapping) - to be used for cost estimating purposes only. Additional allowance of 30kg/m to be made for all folds to balcony setdowns on typical slabs. Final design to be undertaken by specialist PT contractor - Thickness and PT/RC rates may vary from what is shown herewith.
5) Concrete grade to all suspended slabs to be N40 UNO.

COLUMN SCHEDULE
***All columns above and below assumed to have centroid aligned**
***Allow 600-800mm deep capital where column profile and/or orientation changes at transition.**

TOWER COLUMNS

B2 to underside L12:
N80/N65 concrete typically UNO
- C1 - 750 dia circular column (reo rates allow 170kg/m3)
- C2 - 1400x550 column (reo rates allow 200kg/m3)
- C3 - 2000x500 megacolumn (N80, reo rates allow 170kg/m3)
- C4 - 800x800 column (reo rates allow 180kg/m3)
- C5 - 1500x600 column (reo rates allow 180kg/m3)
- B1 - Barette Column 1500x600 column - extends to ground level (reo rates allow 180kg/m3) - Depth TBC by CMW. Design load 21MN

L12 to underside L24:
N65/N50 concrete typically UNO
- C1 - 550 dia circular column (reo rates allow 150kg/m3)
- C2 - 1400x350 column (reo rates allow 180kg/m3)
- C3 - (i) L12 to underside L20 - 2000x500 megacolumn (N80, reo rates allow 170kg/m3)
  (ii) L20 to underside L24 - 1400x300 column (reo rates allow 170kg/m3)
- C4 - 650x650 column (reo rates allow 180kg/m3)
- C5 - 1400x450 column (reo rates allow 180kg/m3)

L24 to Roof:
N50/N40 concrete typically UNO
- C1 - 400 dia circular column (reo rates allow 150kg/m3)
- C2 - 1200x275 column (reo rates allow 160kg/m3)
- C3 - 1200x275 column (reo rates allow 160kg/m3)
- C4 - 450x450 column (reo rates allow 220kg/m3)
- C5 - 1200x300 column (reo rates allow 150kg/m3)

PODIUM/CARPARK COLUMNS

C6 - 1000x400 carpark columns

C6* - 1000x400 carpark columns and allow for 200UC steel plunge columns

- Buttress barrette for lateral restraint to Doughnut slab - Refer CMW for depth.

Tower Barrette Piles - Refer CMW for depth - Refer foundation loading plan

900mm bored piled + pilecap (1.5x1.5x0.8m) - below B2. Depth to be confirmed by CWM. Design load 5MN (service load)

CONSULTANT
Hassell
Hassell LTD ABN 24 007 711 435
Level 1
Commonwealth Bank Building
242 Murray Street
Perth WA 6000 Australia
T +61 8 6477 6000
perth@hassellstudio.com

REFERENCE

NORTH

0m 5m 10m 15m 20m

NOTES
1. Do not scale drawing. Written dimensions govern
2. All dimensions are in millimeters unless noted otherwise
3. All dimensions shall be verified on site before proceeding with the work. Hassell shall be notified in writing of any discrepancies.
4. This drawing must be read in conjunction with all relevant contracts, specifications and drawings

This drawing is an uncontrolled copy. Unless noted otherwise

REV	DESCRIPTION	DATE
1	Preliminary Issue For Planning	29.09.2020
2	Issued For Preliminary Planning Info	05.10.2020
3	Issued for Coordination	06/11/20

CLIENT
ZONE Q

PROJECT
88 MILL POINT ROAD
SOUTH PERTH
WESTERN AUSTRALINA

STATUS

DRAWING TITLE
BASEMENT 01

REVIEWED
Checker

APPROVED
Approver

DRAWING NO.
XX_099

SCALE @ A3
1 : 500

PROJECT NO.
015032

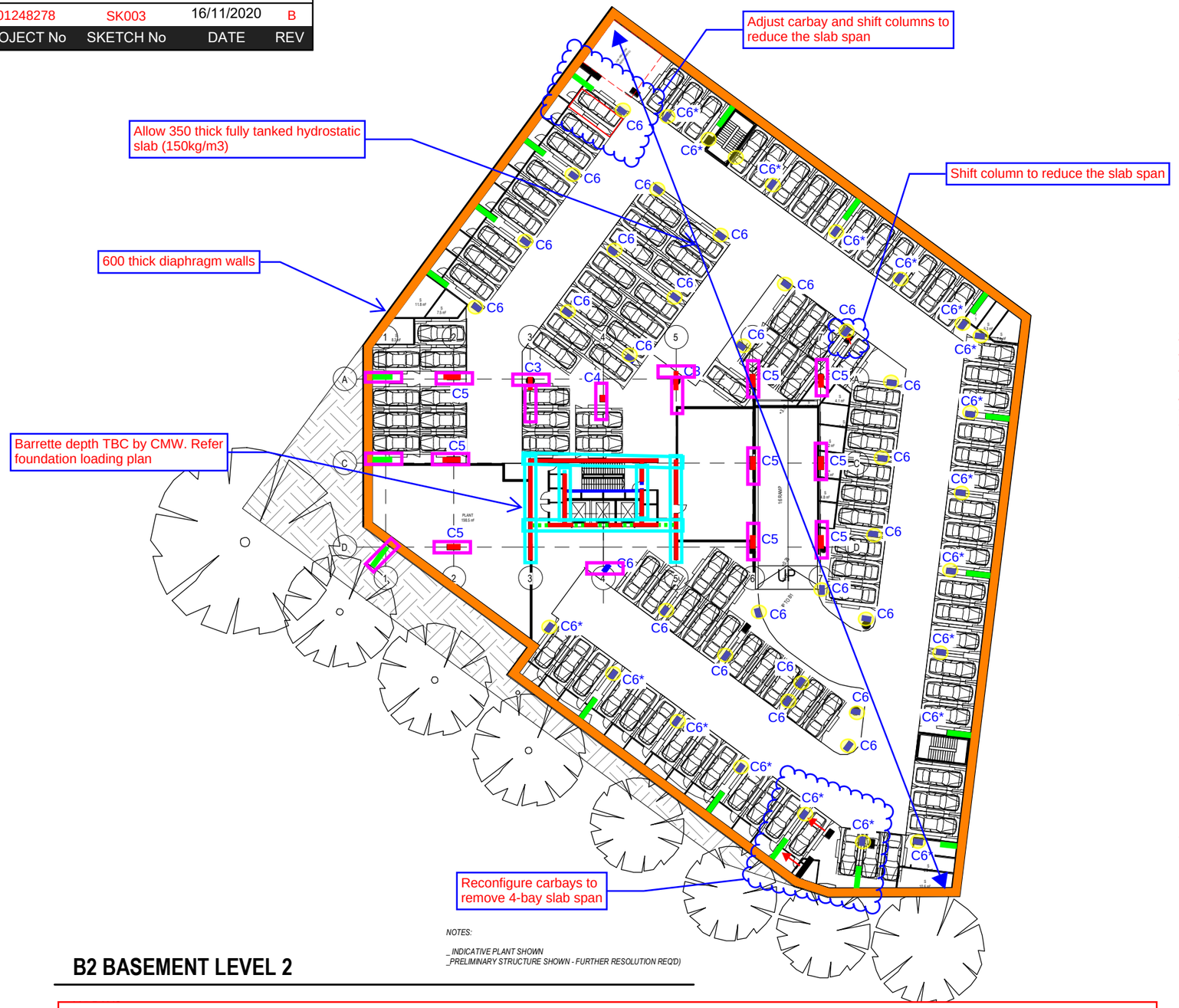
REV NO.
3

Stantec

SKETCH TITLE

88 Mill Point Road - preliminary structural concept

PROJECT No	SKETCH No	DATE	REV
301248278	SK003	16/11/2020	B



B2 BASEMENT LEVEL 2

FOUNDATION OPTION 2
PARTIAL TOP-DOWN WITH LOAD BEARING PILES UNDER CARPARK

NOTES:
1) This concept is based on architectural WIP drawings dated 12/11/2020.
2) Assumed FRL(mins):
   Carpark - 120/120/120
   Common area - 180/180/180
   Residential - 90/90/90
3) Assumed 30mm max setdown to wet areas.
4) PT and RC rates provided are based on prelim design and are approximate only - include trimmers, hairpins, cogs and antiburst (excl lapping) - to be used for cost estimating purposes only. Additional allowance of 30kg/m to be made for all folds to balcony setdowns on typical slabs. Final design to be undertaken by specialist PT contractor - Thickness and PT/RC rates may vary from what is shown herewith.
5) Concrete grade to all suspended slabs to be N40 UNO.

COLUMN SCHEDULE
***All columns above and below assumed to have centroid aligned**
***Allow 600-800mm deep capital where column profile and/or orientation changes at transition.**

TOWER COLUMNS
B2 to underside L12:
N80/N65 concrete typically UNO
- C1 - 750 dia circular column (reo rates allow 170kg/m3)
- C2 - 1400x550 column (reo rates allow 200kg/m3)
- C3 - 2000x500 megacolumn (N80, reo rates allow 170kg/m3)
- C4 - 800x800 column (reo rates allow 180kg/m3)
- C5 - 1500x600 column (reo rates allow 180kg/m3)
- B1 - Barette Column 1500x600 column - extends to ground level (reo rates allow 180kg/m3) - Depth TBC by CMW. Design load 21MN

L12 to underside L24:
N65/N50 concrete typically UNO
- C1 - 550 dia circular column (reo rates allow 150kg/m3)
- C2 - 1400x350 column (reo rates allow 180kg/m3)
- C3 - (i) L12 to underside L20 - 2000x500 megacolumn (N80, reo rates allow 170kg/m3)
  (ii) L20 to underside L24 - 1400x300 column (reo rates allow 170kg/m3)
- C4 - 650x650 column (reo rates allow 180kg/m3)
- C5 - 1400x450 column (reo rates allow 180kg/m3)

L24 to Roof:
N50/N40 concrete typically UNO
- C1 - 400 dia circular column (reo rates allow 150kg/m3)
- C2 - 1200x275 column (reo rates allow 160kg/m3)
- C3 - 1200x275 column (reo rates allow 160kg/m3)
- C4 - 450x450 column (reo rates allow 220kg/m3)
- C5 - 1200x300 column (reo rates allow 150kg/m3)

PODIUM/CARPARK COLUMNS

C6 - 1000x400 carpark columns

C6* - 1000x400 carpark columns and allow for 200UC steel plunge columns

- Buttress barrette for lateral restraint to Doughnut slab - Refer CMW for depth.

Tower Barrette Piles - Refer CMW for depth - Refer foundation loading plan

900mm bored piled + pilecap (1.5x1.5x0.8m) - below B2. Depth to be confirmed by CWM. Design load 5MN (service load)

CONSULTANT
Hassell
Hassell LTD ABN 24 007 711 435
Level 1
Commonwealth Bank Building
242 Murray Street
Perth WA 6000 Australia
T +61 8 6477 6000
perth@hassellstudio.com

REFERENCE

NORTH

0m 5m 10m 15m 20m

NOTES
1. Do not scale drawing. Written dimensions govern
2. All dimensions are in millimeters unless noted otherwise
3. All dimensions shall be verified on site before proceeding with the work. Hassell shall be notified in writing of any discrepancies.
4. This drawing must be read in conjunction with all relevant contracts, specifications and drawings

This drawing is an uncontrolled copy. Unless noted otherwise

REV DESCRIPTION **DATE**

CLIENT
ZONE Q

PROJECT
88 MILL POINT ROAD
SOUTH PERTH
WESTERN AUSTRALINA

STATUS

DRAWING TITLE
BASEMENT 02

REVIEWED
Checker

APPROVED
Approver

DRAWING NO.
XX_098

SCALE @ A3
1 : 500

PROJECT NO.
015032

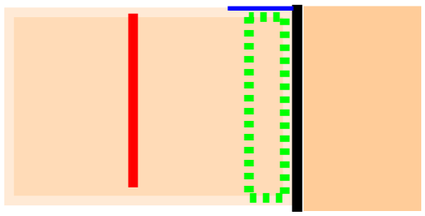
REV NO.

Stantec

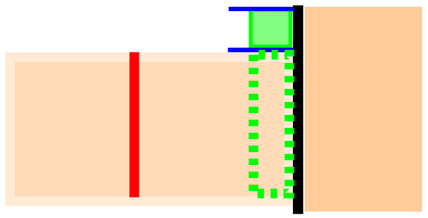
SKETCH TITLE

88 Mill Point Road - preliminary structural concept

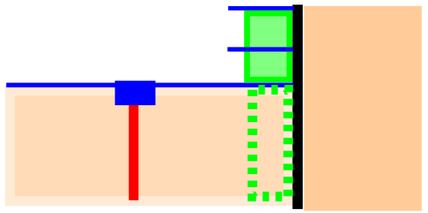
PROJECT No	SKETCH No	DATE	REV
301248278	SK004	16/11/2020	B



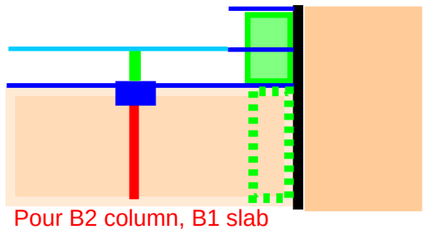
Cast Buttress barrettes



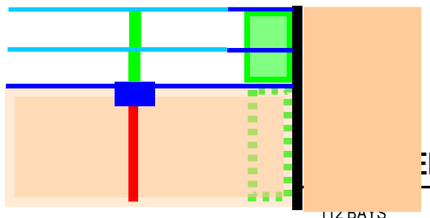
Excavate to B1, pour B1 doughnut slab



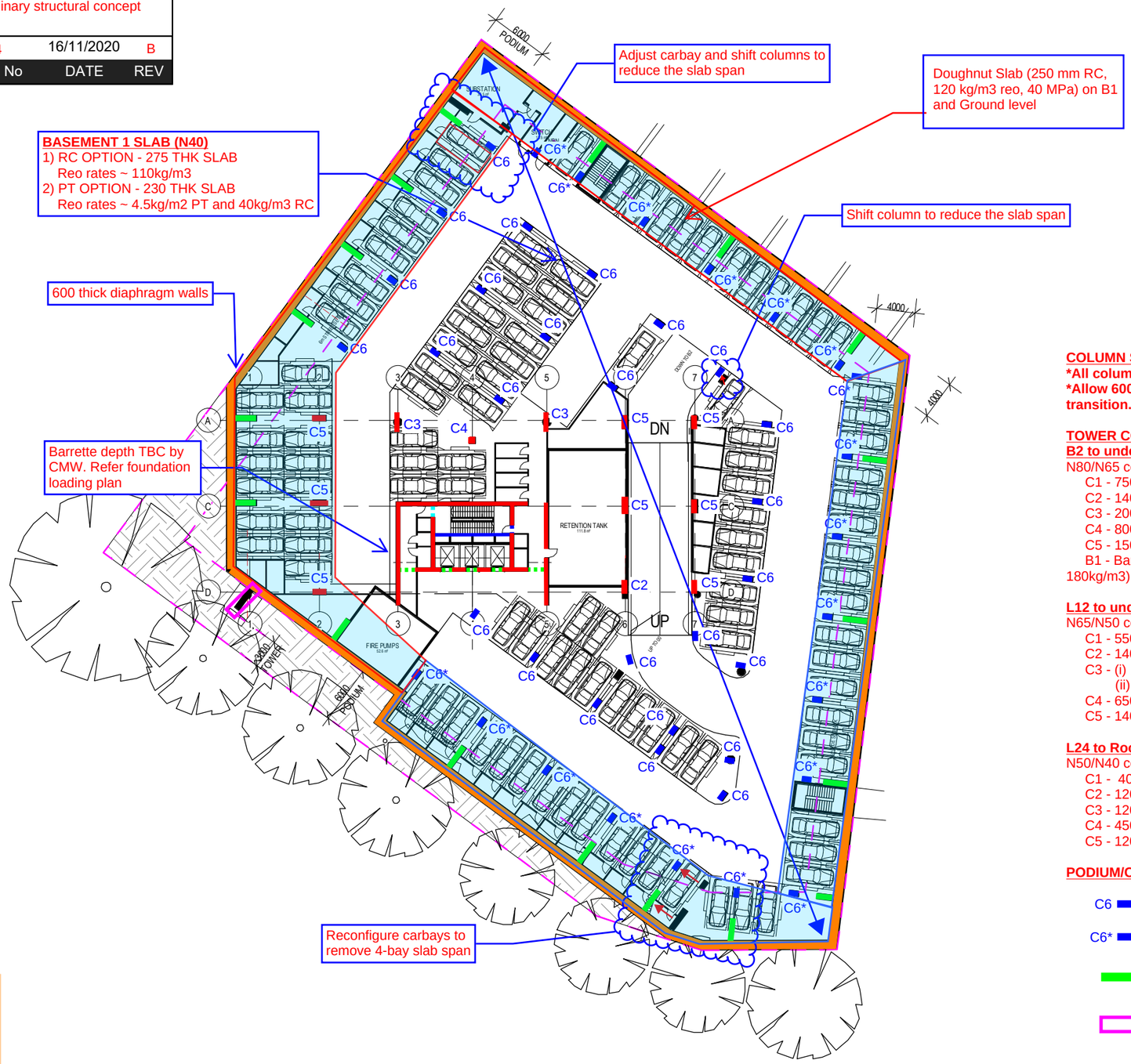
Excavate to B2, pour B2 slab and pilecaps



Pour B2 column, B1 slab



Pour B1 column, Ground slab



EMENT LEVEL 1

112 BAYS
35 STORES

FOUNDATION OPTION 2
PARTIAL TOP-DOWN WITH LOAD BEARING PILES UNDER CARPARK

NOTES:
1) This concept is based on architectural WIP drawings dated 12/11/2020.
2) Assumed FRL(mins):
   Carpark - 120/120/120
   Common area - 180/180/180
   Residential - 90/90/90
3) Assumed 30mm max setdown to wet areas.
4) PT and RC rates provided are based on prelim design and are approximate only - include trimmers, hairpins, cogs and antiburst (excl lapping) - to be used for cost estimating purposes only. Additional allowance of 30kg/m to be made for all folds to balcony setdowns on typical slabs. Final design to be undertaken by specialist PT contractor - Thickness and PT/RC rates may vary from what is shown herewith.
5) Concrete grade to all suspended slabs to be N40 UNO.

COLUMN SCHEDULE
***All columns above and below assumed to have centroid aligned**
***Allow 600-800mm deep capital where column profile and/or orientation changes at transition.**

TOWER COLUMNS
B2 to underside L12:
N80/N65 concrete typically UNO
- C1 - 750 dia circular column (reo rates allow 170kg/m3)
- C2 - 1400x550 column (reo rates allow 200kg/m3)
- C3 - 2000x500 megacolumn (N80, reo rates allow 170kg/m3)
- C4 - 800x800 column (reo rates allow 180kg/m3)
- C5 - 1500x600 column (reo rates allow 180kg/m3)
- B1 - Barette Column 1500x600 column - extends to ground level (reo rates allow 180kg/m3) - Depth TBC by CMW. Design load 21MN

L12 to underside L24:
N65/N50 concrete typically UNO
- C1 - 550 dia circular column (reo rates allow 150kg/m3)
- C2 - 1400x350 column (reo rates allow 180kg/m3)
- C3 - (i) L12 to underside L20 - 2000x500 megacolumn (N80, reo rates allow 170kg/m3)
  (ii) L20 to underside L24 - 1400x300 column (reo rates allow 170kg/m3)
- C4 - 650x650 column (reo rates allow 180kg/m3)
- C5 - 1400x450 column (reo rates allow 180kg/m3)

L24 to Roof:
N50/N40 concrete typically UNO
- C1 - 400 dia circular column (reo rates allow 150kg/m3)
- C2 - 1200x275 column (reo rates allow 160kg/m3)
- C3 - 1200x275 column (reo rates allow 160kg/m3)
- C4 - 450x450 column (reo rates allow 220kg/m3)
- C5 - 1200x300 column (reo rates allow 150kg/m3)

PODIUM/CARPARK COLUMNS

C6 - 1000x400 carpark columns

C6* - 1000x400 carpark columns and allow for 200UC steel plunge columns

- Buttress barrette for lateral restraint to Doughnut slab - Refer CMW for depth.

Tower Barrette Piles - Refer CMW for depth - Refer foundation loading plan

900mm bored piled + pilecap (1.5x1.5x0.8m) - below B2. Depth to be confirmed by CWM. Design load 5MN (service load)

CONSULTANT
Hassell
Hassell LTD ABN 24 007 711 435
Level 1
Commonwealth Bank Building
242 Murray Street
Perth WA 6000 Australia
T +61 8 6477 6000
perth@hassellstudio.com

REFERENCE

NORTH

0m 5m 10m 15m 20m

NOTES
1. Do not scale drawing. Written dimensions govern
2. All dimensions are in millimeters unless noted otherwise
3. All dimensions shall be verified on site before proceeding with the work. Hassell shall be notified in writing of any discrepancies.
4. This drawing must be read in conjunction with all relevant contracts, specifications and drawings

This drawing is an uncontrolled copy. Unless noted otherwise

REV	DESCRIPTION	DATE
1	Preliminary Issue For Planning	29.09.2020
2	Issued For Preliminary Planning Info	05.10.2020
3	Issued for Coordination	06/11/20

CLIENT
ZONE Q

PROJECT
88 MILL POINT ROAD
SOUTH PERTH
WESTERN AUSTRALINA

STATUS

DRAWING TITLE
BASEMENT 01

REVIEWED
Checker

APPROVED
Approver

DRAWING NO.
XX_099

SCALE @ A3
1 : 500

PROJECT NO.
015032

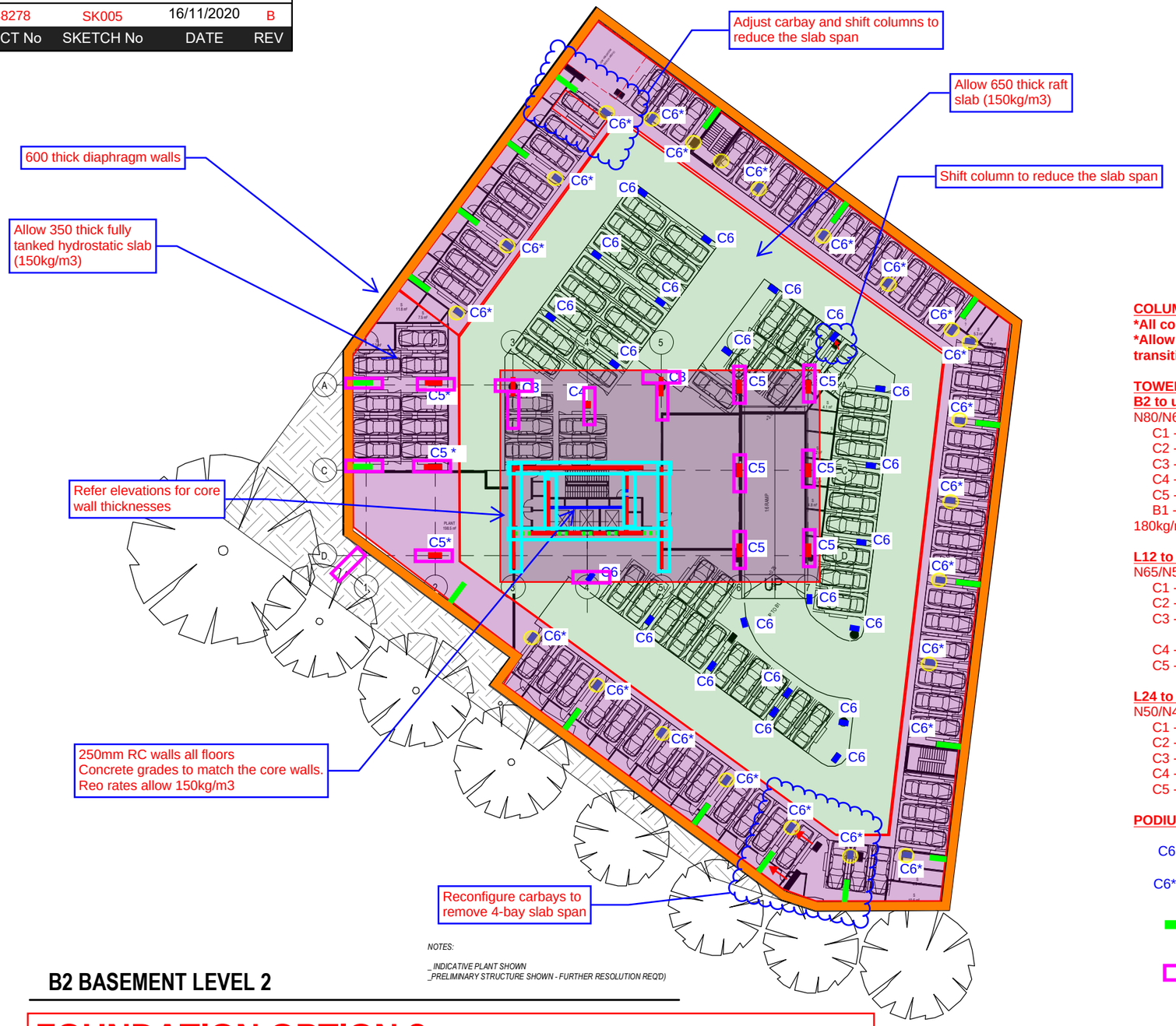
REV NO.
3

Stantec

SKETCH TITLE

88 Mill Point Road - preliminary structural concept

PROJECT No	SKETCH No	DATE	REV
301248278	SK005	16/11/2020	B



B2 BASEMENT LEVEL 2

FOUNDATION OPTION 3
PARTIAL TOP-DOWN WITH RAFT UNDER CARPARK

NOTES:
1) This concept is based on architectural WIP drawings dated 12/11/2020.
2) Assumed FRL(mins):
   Carpark - 120/120/120
   Common area - 180/180/180
   Residential - 90/90/90
3) Assumed 30mm max setdown to wet areas.
4) PT and RC rates provided are based on prelim design and are approximate only - include trimmers, hairpins, cogs and antiburst (excl lapping) - to be used for cost estimating purposes only. Additional allowance of 30kg/m to be made for all folds to balcony setdowns on typical slabs. Final design to be undertaken by specialist PT contractor - Thickness and PT/RC rates may vary from what is shown herewith.
5) Concrete grade to all suspended slabs to be N40 UNO.

COLUMN SCHEDULE
***All columns above and below assumed to have centroid aligned**
***Allow 600-800mm deep capital where column profile and/or orientation changes at transition.**

TOWER COLUMNS
B2 to underside L12:
N80/N65 concrete typically UNO
- C1 - 750 dia circular column (reo rates allow 170kg/m3)
- C2 - 1400x550 column (reo rates allow 200kg/m3)
- C3 - 2000x500 megacolumn (N80, reo rates allow 170kg/m3)
- C4 - 800x800 column (reo rates allow 180kg/m3)
- C5 - 1500x600 column (reo rates allow 180kg/m3)
- B1 - Barette Column 1500x600 column - extends to ground level (reo rates allow 180kg/m3) - Depth TBC by CMW. Refer foundation loading plan

L12 to underside L24:
N65/N50 concrete typically UNO
- C1 - 550 dia circular column (reo rates allow 150kg/m3)
- C2 - 1400x350 column (reo rates allow 180kg/m3)
- C3 - (i) L12 to underside L20 - 2000x500 megacolumn (N80, reo rates allow 170kg/m3)
  (ii) L20 to underside L24 - 1400x300 column (reo rates allow 170kg/m3)
- C4 - 650x650 column (reo rates allow 180kg/m3)
- C5 - 1400x450 column (reo rates allow 180kg/m3)

L24 to Roof:
N50/N40 concrete typically UNO
- C1 - 400 dia circular column (reo rates allow 150kg/m3)
- C2 - 1200x275 column (reo rates allow 160kg/m3)
- C3 - 1200x275 column (reo rates allow 160kg/m3)
- C4 - 450x450 column (reo rates allow 220kg/m3)
- C5 - 1200x300 column (reo rates allow 150kg/m3)

PODIUM/CARPARK COLUMNS

C6 - 1000x400 carpark columns

C6* - 1000x400 carpark columns and allow for 200UC steel plunge columns

- Buttress barrette for lateral restraint to Doughnut slab - Refer CMW for depth.

Tower Barrette Piles - Refer CMW for depth - Refer foundation loading plan

900mm bored piled - below B2. Depth to be confirmed by CWM. Design load 5MN (service load)

H

CONSULTANT
Hassell
Hassell LTD ABN 24 007 711 435
Level 1
Commonwealth Bank Building
242 Murray Street
Perth WA 6000 Australia
T +61 8 6477 6000
perth@hassellstudio.com

REFERENCE

NORTH

0m 5m 10m 15m 20m

NOTES
1. Do not scale drawing. Written dimensions govern
2. All dimensions are in millimeters unless noted otherwise
3. All dimensions shall be verified on site before proceeding with the work. Hassell shall be notified in writing of any discrepancies.
4. This drawing must be read in conjunction with all relevant contracts, specifications and drawings

This drawing is an uncontrolled copy. Unless noted otherwise

REV DESCRIPTION **DATE**

CLIENT
ZONE Q

PROJECT
88 MILL POINT ROAD
SOUTH PERTH
WESTERN AUSTRALINA

STATUS

DRAWING TITLE
BASEMENT 02

REVIEWED
Checker

APPROVED
Approver

DRAWING NO.
XX_098

SCALE @ A3
1 : 500

PROJECT NO.
015032

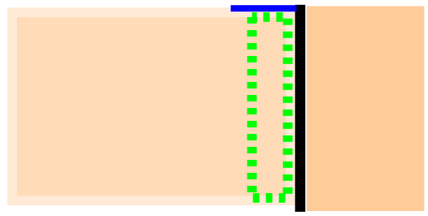
REV NO.

Stantec

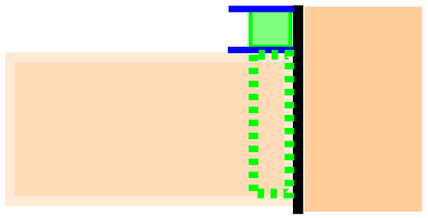
SKETCH TITLE

88 Mill Point Road - preliminary structural concept

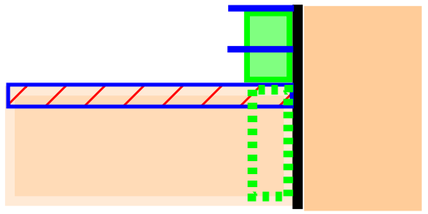
PROJECT No	SKETCH No	DATE	REV
301248278	SK006	16/11/2020	B



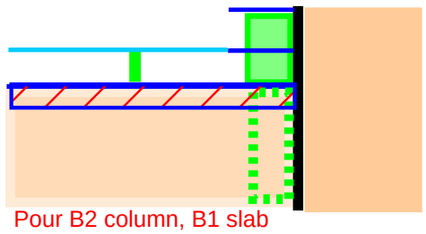
Cast Buttress barrettes



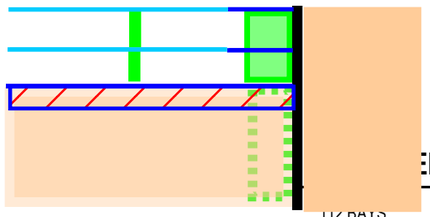
Excavate to B1, pour B1 doughnut slab



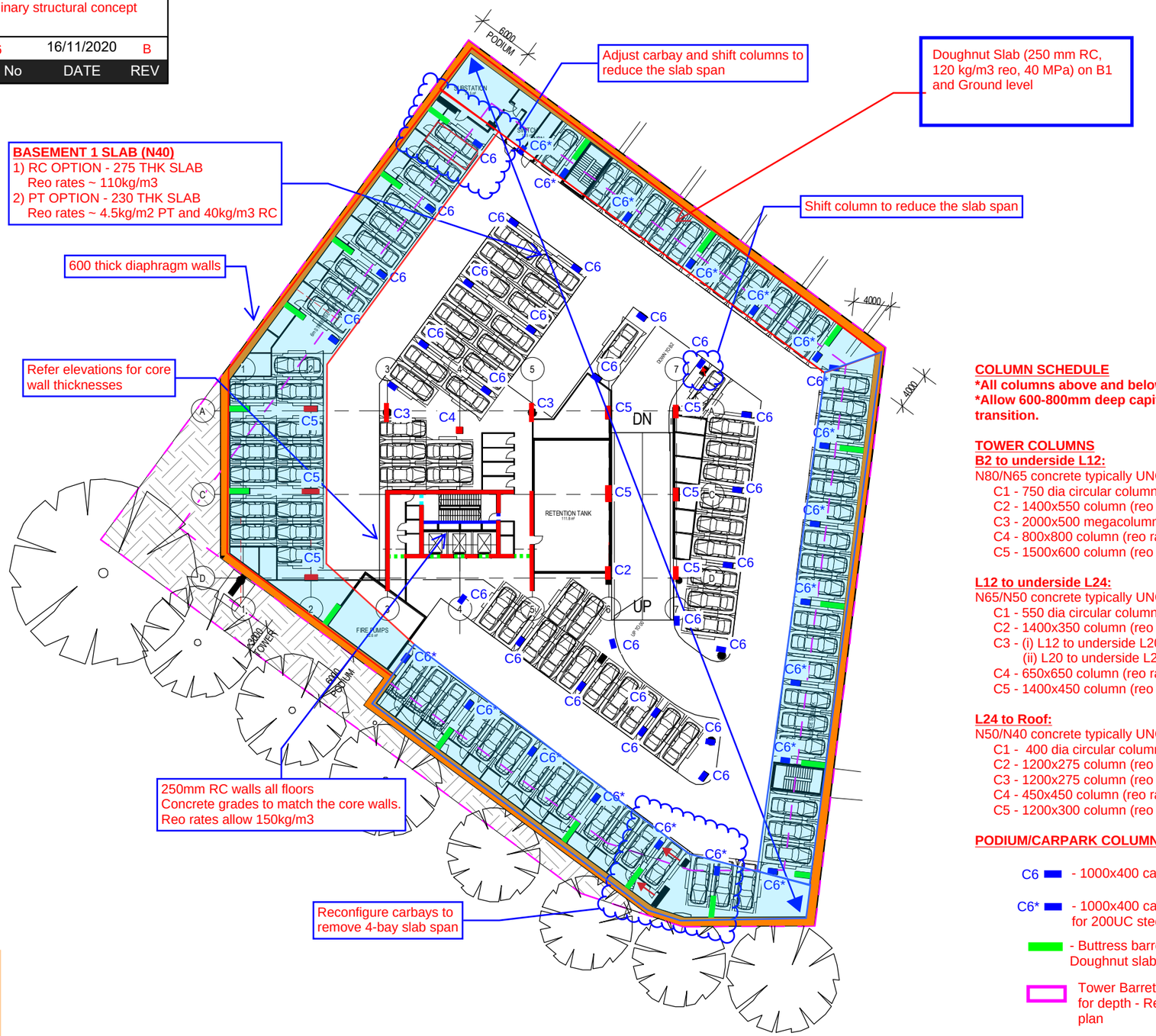
Excavate to B2, pour B2 Raft



Pour B2 column, B1 slab



Pour B1 column, Ground slab



NOTES:

1) This concept is based on architectural WIP drawings dated 12/11/2020.
2) Assumed FRL(mins):
   Carpark - 120/120/120
   Common area - 180/180/180
   Residential - 90/90/90
3) Assumed 30mm max setdown to wet areas.
4) PT and RC rates provided are based on prelim design and are approximate only - include trimmers, hairpins, cogs and antiburst (excl lapping) - to be used for cost estimating purposes only. Additional allowance of 30kg/m to be made for all folds to balcony setdowns on typical slabs. Final design to be undertaken by specialist PT contractor - Thickness and PT/RC rates may vary from what is shown herewith.
5) Concrete grade to all suspended slabs to be N40 UNO.

COLUMN SCHEDULE

***All columns above and below assumed to have centroid aligned**
***Allow 600-800mm deep capital where column profile and/or orientation changes at transition.**

TOWER COLUMNS

B2 to underside L12:

N80/N65 concrete typically UNO
- C1 - 750 dia circular column (reo rates allow 170kg/m3)
- C2 - 1400x550 column (reo rates allow 200kg/m3)
- C3 - 2000x500 megacolumn (N80, reo rates allow 170kg/m3)
- C4 - 800x800 column (reo rates allow 180kg/m3)
- C5 - 1500x600 column (reo rates allow 180kg/m3)

L12 to underside L24:

N65/N50 concrete typically UNO
- C1 - 550 dia circular column (reo rates allow 150kg/m3)
- C2 - 1400x350 column (reo rates allow 180kg/m3)
- C3 - (i) L12 to underside L20 - 2000x500 megacolumn (N80, reo rates allow 170kg/m3)
  (ii) L20 to underside L24 - 1400x300 column (reo rates allow 170kg/m3)
- C4 - 650x650 column (reo rates allow 180kg/m3)
- C5 - 1400x450 column (reo rates allow 180kg/m3)

L24 to Roof:

N50/N40 concrete typically UNO
- C1 - 400 dia circular column (reo rates allow 150kg/m3)
- C2 - 1200x275 column (reo rates allow 160kg/m3)
- C3 - 1200x275 column (reo rates allow 160kg/m3)
- C4 - 450x450 column (reo rates allow 220kg/m3)
- C5 - 1200x300 column (reo rates allow 150kg/m3)

PODIUM/CARPARK COLUMNS

- C6 - 1000x400 carpark columns
- C6* - 1000x400 carpark columns and allow for 200UC steel plunge columns
- Buttress barrette for lateral restraint to Doughnut slab - Refer CMW for depth.
- Tower Barrette Piles - Refer CMW for depth - Refer foundation loading plan
- 900mm bored piled - below B2. Depth to be confirmed by CWM. Design load 5MN (service load)

EMENT LEVEL 1

112 BAYS
35 STORES

FOUNDATION OPTION 3
PARTIAL TOP-DOWN WITH RAFT UNDER CARPARK

CONSULTANT
Hassell
Hassell LTD ABN 24 007 711 435
Level 1
Commonwealth Bank Building
242 Murray Street
Perth WA 6000 Australia
T +61 8 6477 6000
perth@hassellstudio.com

REFERENCE

NORTH

0m 5m 10m 15m 20m

NOTES
1. Do not scale drawing. Written dimensions govern
2. All dimensions are in millimeters unless noted otherwise
3. All dimensions shall be verified on site before proceeding with the work. Hassell shall be notified in writing of any discrepancies.
4. This drawing must be read in conjunction with all relevant contracts, specifications and drawings

This drawing is an uncontrolled copy. Unless noted otherwise

REV	DESCRIPTION	DATE
1	Preliminary Issue For Planning	29.09.2020
2	Issued For Preliminary Planning Info	05.10.2020
3	Issued for Coordination	06/11/20

CLIENT
ZONE Q

PROJECT
88 MILL POINT ROAD
SOUTH PERTH
WESTERN AUSTRALINA

STATUS

DRAWING TITLE
BASEMENT 01

REVIEWED
Checker

APPROVED
Approver

DRAWING NO.
XX_099

SCALE @ A3
1 : 500

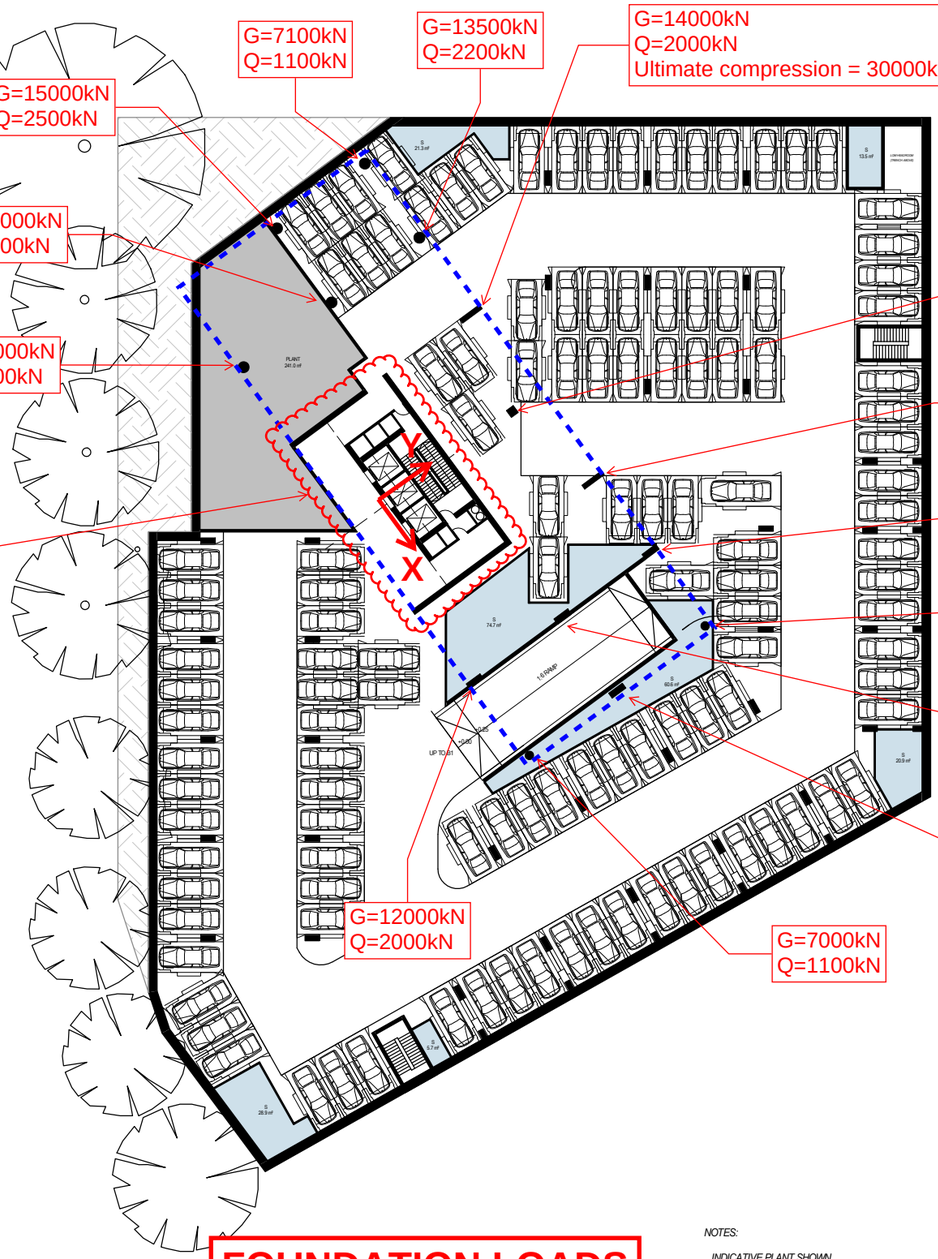
PROJECT NO.
015032

REV NO.
3

Stantec

SKETCH TITLE
88 Mill Point Road - preliminary structural concept

301248278	SK007	16/11/2020	B
PROJECT No	SKETCH No	DATE	REV



Tower Core:
G=165000kN
Q=30000kN
Ultimate base shear in Y direction = 14000kN
Ultimate base moment about X axis = 640000kNm
Ultimate base shear in X direction = 18000kN
Ultimate base moment about Y axis = 571000kNm

NOTES:
1) G = unfactored dead load
   Q = unfactored live load
2) All loads shown are preliminary and subject to change with the final layout.

Carpark columns (typical):
Allow the following preliminary loads
G=3000kN
Q=800kN

FOUNDATION LOADS

NOTES:

_ INDICATIVE PLANT SHOWN
_PRELIMINARY STRUCTURE SHOWN - FURTHER RESOLUTION REQ'D)

_123 BAYS
_SITE AREA = 4759sqm
_380sqn DEEP SOIL AREA ACHIEVED AT GROUND LEVEL & BELOW (8%)
_49 STORES

Stantec

SKETCH TITLE
88 Mill Point Road - structural concept memo

301248278	SK001	16/11/2020	B
PROJECT No	SKETCH No	DATE	REV

CONSULTANT
Hassell
Hassell LTD ABN 24 007 711 435
Level 1
Commonwealth Bank Building
242 Murray Street
Perth WA 6000 Australia
T +61 8 6477 6000
perth@hassellstudio.com

REFERENCE

NORTH

0m 5m 10m 15m 20m

NOTES
1. Do not scale drawing. Written dimensions govern
2. All dimensions are in millimeters unless noted otherwise
3. All dimensions shall be verified on site before proceeding with the work. Hassell shall be notified in writing of any discrepancies.
4. This drawing must be read in conjunction with all relevant contracts, specifications and drawings

This drawing is an uncontrolled copy. Unless noted otherwise

REV DESCRIPTION **DATE**

CLIENT
ZONE Q

PROJECT
88 MILL POINT ROAD
SOUTH PERTH
WESTERN AUSTRALINA

STATUS

DRAWING TITLE
BASEMENT 02

REVIEWED
Checker

APPROVED
Approver

DRAWING NO.
XX_098

SCALE @ A3
1 : 500

PROJECT NO.
015032

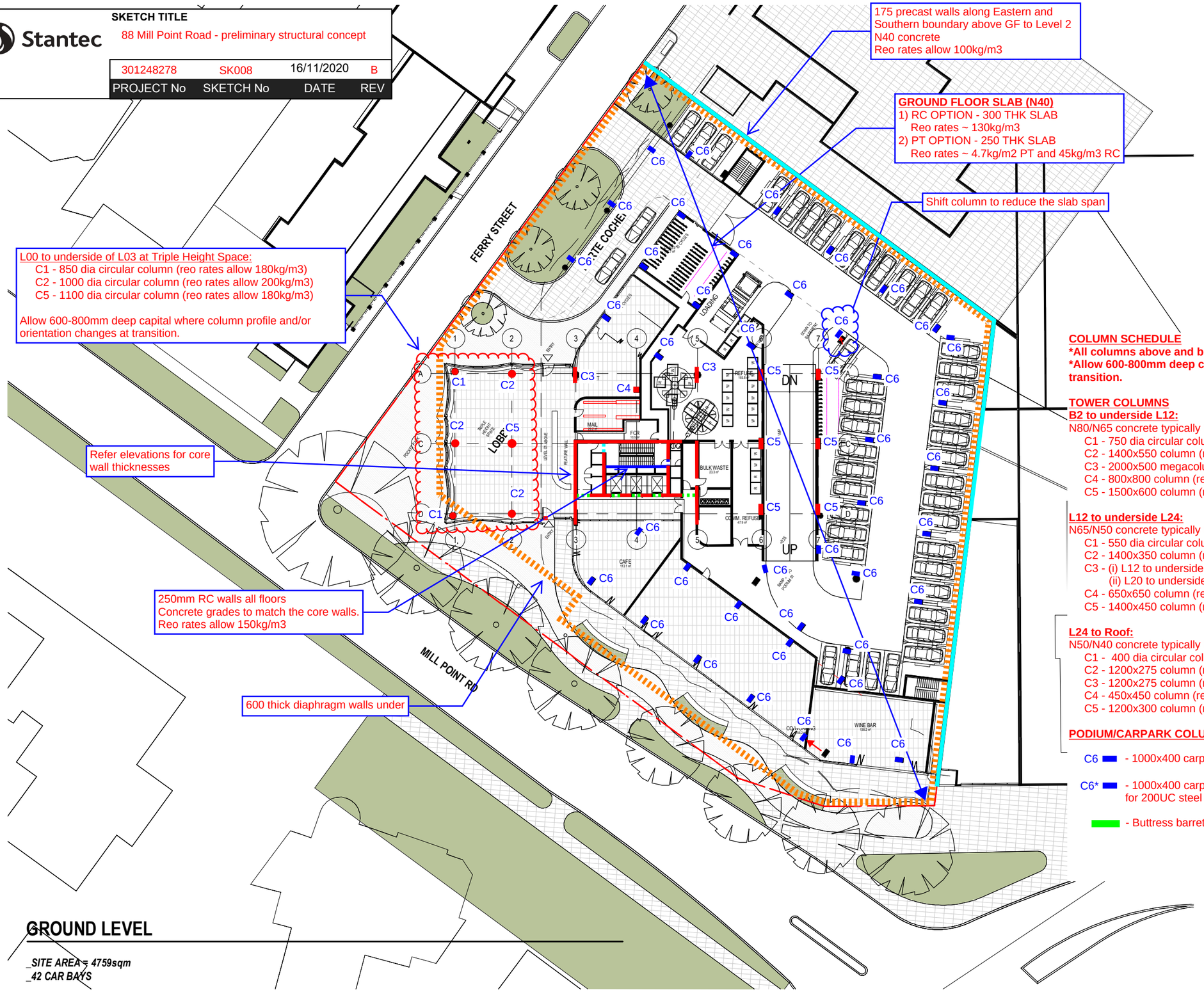
REV NO.

Stantec

SKETCH TITLE

88 Mill Point Road - preliminary structural concept

PROJECT No	SKETCH No	DATE	REV
301248278	SK008	16/11/2020	B



175 precast walls along Eastern and Southern boundary above GF to Level 2
N40 concrete
Reo rates allow 100kg/m3

GROUND FLOOR SLAB (N40)
1) RC OPTION - 300 THK SLAB
Reo rates ~ 130kg/m3
2) PT OPTION - 250 THK SLAB
Reo rates ~ 4.7kg/m2 PT and 45kg/m3 RC

Shift column to reduce the slab span

L00 to underside of L03 at Triple Height Space:
C1 - 850 dia circular column (reo rates allow 180kg/m3)
C2 - 1000 dia circular column (reo rates allow 200kg/m3)
C5 - 1100 dia circular column (reo rates allow 180kg/m3)

Allow 600-800mm deep capital where column profile and/or orientation changes at transition.

Refer elevations for core wall thicknesses

250mm RC walls all floors
Concrete grades to match the core walls.
Reo rates allow 150kg/m3

600 thick diaphragm walls under

NOTES:
1) This concept is based on architectural WIP drawings dated 12/11/2020.
2) Assumed FRL(mins):
Carpark - 120/120/120
Common area - 180/180/180
Residential - 90/90/90
3) Assumed 30mm max setdown to wet areas.
4) PT and RC rates provided are based on prelim design and are approximate only - include trimmers, hairpins, cogs and antiburst (excl lapping) - to be used for cost estimating purposes only.
Additional allowance of 30kg/m to be made for all folds to balcony setdowns on typical slabs. Final design to be undertaken by specialist PT contractor - Thickness and PT/RC rates may vary from what is shown herewith.
5) Concrete grade to all suspended slabs to be N40 UNO.

COLUMN SCHEDULE
***All columns above and below assumed to have centroid aligned**
***Allow 600-800mm deep capital where column profile and/or orientation changes at transition.**

TOWER COLUMNS
B2 to underside L12:
N80/N65 concrete typically UNO
C1 - 750 dia circular column (reo rates allow 170kg/m3)
C2 - 1400x550 column (reo rates allow 200kg/m3)
C3 - 2000x500 megacolumn (N80, reo rates allow 170kg/m3)
C4 - 800x800 column (reo rates allow 180kg/m3)
C5 - 1500x600 column (reo rates allow 180kg/m3)

L12 to underside L24:
N65/N50 concrete typically UNO
C1 - 550 dia circular column (reo rates allow 150kg/m3)
C2 - 1400x350 column (reo rates allow 180kg/m3)
C3 - (i) L12 to underside L20 - 2000x500 megacolumn (N80, reo rates allow 170kg/m3)
(ii) L20 to underside L24 - 1400x300 column (reo rates allow 170kg/m3)
C4 - 650x650 column (reo rates allow 180kg/m3)
C5 - 1400x450 column (reo rates allow 180kg/m3)

L24 to Roof:
N50/N40 concrete typically UNO
C1 - 400 dia circular column (reo rates allow 150kg/m3)
C2 - 1200x275 column (reo rates allow 160kg/m3)
C3 - 1200x275 column (reo rates allow 160kg/m3)
C4 - 450x450 column (reo rates allow 220kg/m3)
C5 - 1200x300 column (reo rates allow 150kg/m3)

PODIUM/CARPARK COLUMNS

C6 - 1000x400 carpark columns

C6* - 1000x400 carpark columns and allow for 200UC steel plunge columns

- Buttress barrette

GROUND LEVEL

_SITE AREA = 4759sqm
_42 CAR BAYS

H

CONSULTANT
Hassell
Hassell LTD ABN 24 007 711 435
Level 1
Commonwealth Bank Building
242 Murray Street
Perth WA 6000 Australia
T +61 8 6477 6000
perth@hassellstudio.com

REFERENCE

NORTH

0m 5m 10m 15m 20m

NOTES
1. Do not scale drawing. Written dimensions govern
2. All dimensions are in millimeters unless noted otherwise
3. All dimensions shall be verified on site before proceeding with the work. Hassell shall be notified in writing of any discrepancies.
4. This drawing must be read in conjunction with all relevant contracts, specifications and drawings

This drawing is an uncontrolled copy. Unless noted otherwise

REV	DESCRIPTION	DATE
1	Preliminary Issue For Planning	29.09.2020
2	Issued For Preliminary Planning Info	05.10.2020
3	Issued for Coordination	06/11/20

CLIENT
ZONE Q

PROJECT
88 MILL POINT ROAD
SOUTH PERTH
WESTERN AUSTRALINA

STATUS

DRAWING TITLE
LEVEL 00

REVIEWED
Checker

APPROVED
Approver

DRAWING NO.
XX_100

SCALE @ A3
1 : 500

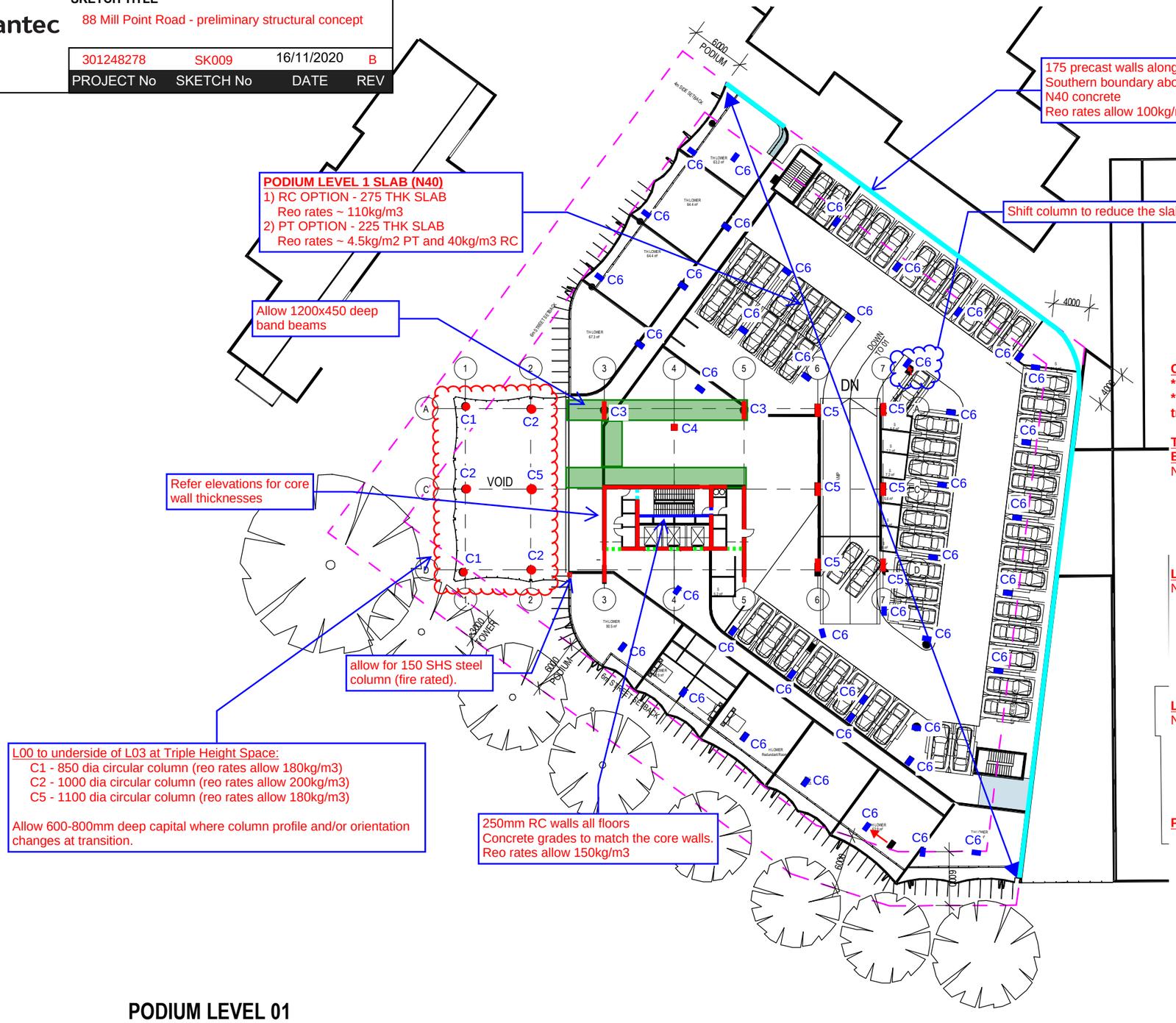
PROJECT NO.
015032

REV NO.
3

Stantec

SKETCH TITLE
88 Mill Point Road - preliminary structural concept

PROJECT No	SKETCH No	DATE	REV
301248278	SK009	16/11/2020	B



PODIUM LEVEL 1 SLAB (N40)
1) RC OPTION - 275 THK SLAB
Reo rates ~ 110kg/m3
2) PT OPTION - 225 THK SLAB
Reo rates ~ 4.5kg/m2 PT and 40kg/m3 RC

Allow 1200x450 deep band beams

Refer elevations for core wall thicknesses

allow for 150 SHS steel column (fire rated).

L00 to underside of L03 at Triple Height Space:
C1 - 850 dia circular column (reo rates allow 180kg/m3)
C2 - 1000 dia circular column (reo rates allow 200kg/m3)
C5 - 1100 dia circular column (reo rates allow 180kg/m3)

Allow 600-800mm deep capital where column profile and/or orientation changes at transition.

250mm RC walls all floors
Concrete grades to match the core walls.
Reo rates allow 150kg/m3

175 precast walls along Eastern and Southern boundary above GF to Level 2
N40 concrete
Reo rates allow 100kg/m3

Shift column to reduce the slab span

NOTES:
1) This concept is based on architectural WIP drawings dated 12/11/2020.
2) Assumed FRL(mins):
Carpark - 120/120/120
Common area - 180/180/180
Residential - 90/90/90
3) Assumed 30mm max setdown to wet areas.
4) PT and RC rates provided are based on prelim design and are approximate only - include trimmers, hairpins, cogs and antiburst (excl lapping) - to be used for cost estimating purposes only.
Additional allowance of 30kg/m to be made for all folds to balcony setdowns on typical slabs. Final design to be undertaken by specialist PT contractor - Thickness and PT/RC rates may vary from what is shown herewith.
5) Concrete grade to all suspended slabs to be N40 UNO.

COLUMN SCHEDULE
***All columns above and below assumed to have centroid aligned**
***Allow 600-800mm deep capital where column profile and/or orientation changes at transition.**

TOWER COLUMNS
B2 to underside L12:
N80/N65 concrete typically UNO
C1 - 750 dia circular column (reo rates allow 170kg/m3)
C2 - 1400x550 column (reo rates allow 200kg/m3)
C3 - 2000x500 megacolumn (N80, reo rates allow 170kg/m3)
C4 - 800x800 column (reo rates allow 180kg/m3)
C5 - 1500x600 column (reo rates allow 180kg/m3)

L12 to underside L24:
N65/N50 concrete typically UNO
C1 - 550 dia circular column (reo rates allow 150kg/m3)
C2 - 1400x350 column (reo rates allow 180kg/m3)
C3 - (i) L12 to underside L20 - 2000x500 megacolumn (N80, reo rates allow 170kg/m3)
(ii) L20 to underside L24 - 1400x300 column (reo rates allow 170kg/m3)
C4 - 650x650 column (reo rates allow 180kg/m3)
C5 - 1400x450 column (reo rates allow 180kg/m3)

L24 to Roof:
N50/N40 concrete typically UNO
C1 - 400 dia circular column (reo rates allow 150kg/m3)
C2 - 1200x275 column (reo rates allow 160kg/m3)
C3 - 1200x275 column (reo rates allow 160kg/m3)
C4 - 450x450 column (reo rates allow 220kg/m3)
C5 - 1200x300 column (reo rates allow 150kg/m3)

PODIUM/CARPARK COLUMNS
C6 - 1000x400 carpark columns
C6* - 1000x400 carpark columns and allow for 200UC steel plunge columns
- Buttress barrette

PODIUM LEVEL 01

_57 CAR BAYS
_X STORES

NOTES:

_ISSUED FOR PRELIMINARY PLANNING INFORMATION ONLY
_DRAWINGS SUBJECT TO FURTHER DESIGN DEVELOPMENT
_GENERAL SPATIALS SUBJECT TO FURTHER DESIGN DEVELOPMENT
_LANDSCAPE IS INDICATIVE

CONSULTANT
Hassell
Hassell LTD ABN 24 007 711 435
Level 1
Commonwealth Bank Building
242 Murray Street
Perth WA 6000 Australia
T +61 8 6477 6000
perth@hassellstudio.com

REFERENCE

NORTH

0m 5m 10m 15m 20m

NOTES
1. Do not scale drawing. Written dimensions govern
2. All dimensions are in millimeters unless noted otherwise
3. All dimensions shall be verified on site before proceeding with the work. Hassell shall be notified in writing of any discrepancies.
4. This drawing must be read in conjunction with all relevant contracts, specifications and drawings

This drawing is an uncontrolled copy. Unless noted otherwise

REV	DESCRIPTION	DATE
1	Preliminary Issue For Planning	29.09.2020
2	Issued For Preliminary Planning Info	05.10.2020

CLIENT
ZONE Q

PROJECT
88 MILL POINT ROAD
SOUTH PERTH
WESTERN AUSTRALINA

STATUS

DRAWING TITLE
PODIUM 01

REVIEWED
Checker

APPROVED
Approver

DRAWING NO.
XX_101

SCALE @ A3
1 : 500

PROJECT NO.
015032

REV NO.
2

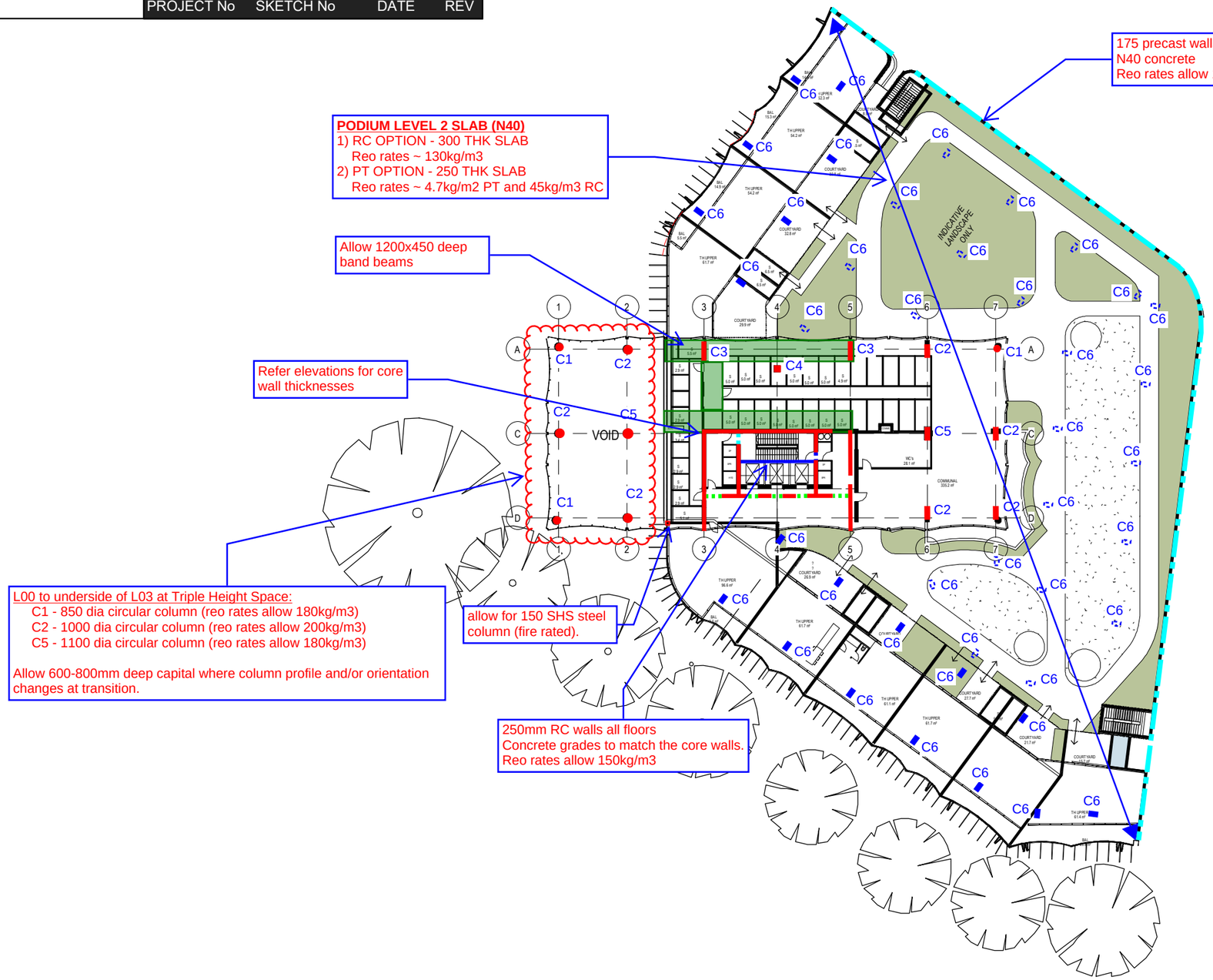
Stantec

SKETCH TITLE

88 Mill Point Road - preliminary structural concept

PROJECT No	SKETCH No	DATE	REV
301248278	SK010	16/11/2020	B

NOTES:
1) This concept is based on architectural WIP drawings dated 12/11/2020.
2) Assumed FRL(mins):
   Carpark - 120/120/120
   Common area - 180/180/180
   Residential - 90/90/90
3) Assumed 30mm max setdown to wet areas.
4) PT and RC rates provided are based on prelim design and are approximate only - include trimmers, hairpins, cogs and antiburst (excl lapping) - to be used for cost estimating purposes only. Additional allowance of 30kg/m to be made for all folds to balcony setdowns on typical slabs. Final design to be undertaken by specialist PT contractor - Thickness and PT/RC rates may vary from what is shown herewith.
5) Concrete grade to all suspended slabs to be N40 UNO.



COLUMN SCHEDULE
***All columns above and below assumed to have centroid aligned**
***Allow 600-800mm deep capital where column profile and/or orientation changes at transition.**

TOWER COLUMNS

B2 to underside L12:
N80/N65 concrete typically UNO
- C1 - 750 dia circular column (reo rates allow 170kg/m3)
- C2 - 1400x550 column (reo rates allow 200kg/m3)
- C3 - 2000x500 megacolumn (N80, reo rates allow 170kg/m3)
- C4 - 800x800 column (reo rates allow 180kg/m3)
- C5 - 1500x600 column (reo rates allow 180kg/m3)

L12 to underside L24:
N65/N50 concrete typically UNO
- C1 - 550 dia circular column (reo rates allow 150kg/m3)
- C2 - 1400x350 column (reo rates allow 180kg/m3)
- C3 - (i) L12 to underside L20 - 2000x500 megacolumn (N80, reo rates allow 170kg/m3)
  (ii) L20 to underside L24 - 1400x300 column (reo rates allow 170kg/m3)
- C4 - 650x650 column (reo rates allow 180kg/m3)
- C5 - 1400x450 column (reo rates allow 180kg/m3)

L24 to Roof:
N50/N40 concrete typically UNO
- C1 - 400 dia circular column (reo rates allow 150kg/m3)
- C2 - 1200x275 column (reo rates allow 160kg/m3)
- C3 - 1200x275 column (reo rates allow 160kg/m3)
- C4 - 450x450 column (reo rates allow 220kg/m3)
- C5 - 1200x300 column (reo rates allow 150kg/m3)

PODIUM/CARPARK COLUMNS

C6 - 1000x400 carpark columns under

C6 - 1000x400 carpark columns

C6* - 1000x400 carpark columns and allow for 200UC steel plunge columns

- Buttress barrette

PODIUM LEVEL 02

_33 STORES

CONSULTANT
Hassell
Hassell LTD ABN 24 007 711 435
Level 1
Commonwealth Bank Building
242 Murray Street
Perth WA 6000 Australia
T +61 8 6477 6000
perth@hassellstudio.com

REFERENCE

NORTH

0m 5m 10m 15m 20m

NOTES
1. Do not scale drawing. Written dimensions govern
2. All dimensions are in millimeters unless noted otherwise
3. All dimensions shall be verified on site before proceeding with the work. Hassell shall be notified in writing of any discrepancies.
4. This drawing must be read in conjunction with all relevant contracts, specifications and drawings

This drawing is an uncontrolled copy. Unless noted otherwise

REV DESCRIPTION **DATE**

CLIENT
ZONE Q

PROJECT
88 MILL POINT ROAD
SOUTH PERTH
WESTERN AUSTRALINA

STATUS

DRAWING TITLE
PODIUM 02

REVIEWED
Checker

APPROVED
Approver

DRAWING NO.
XX_102

SCALE @ A3
1 : 500

PROJECT NO.
015032

REV NO.

Stantec

SKETCH TITLE

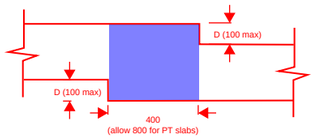
88 Mill Point Road - preliminary structural concept

PROJECT No	SKETCH No	DATE	REV
301248278	SK011	16/11/2020	B

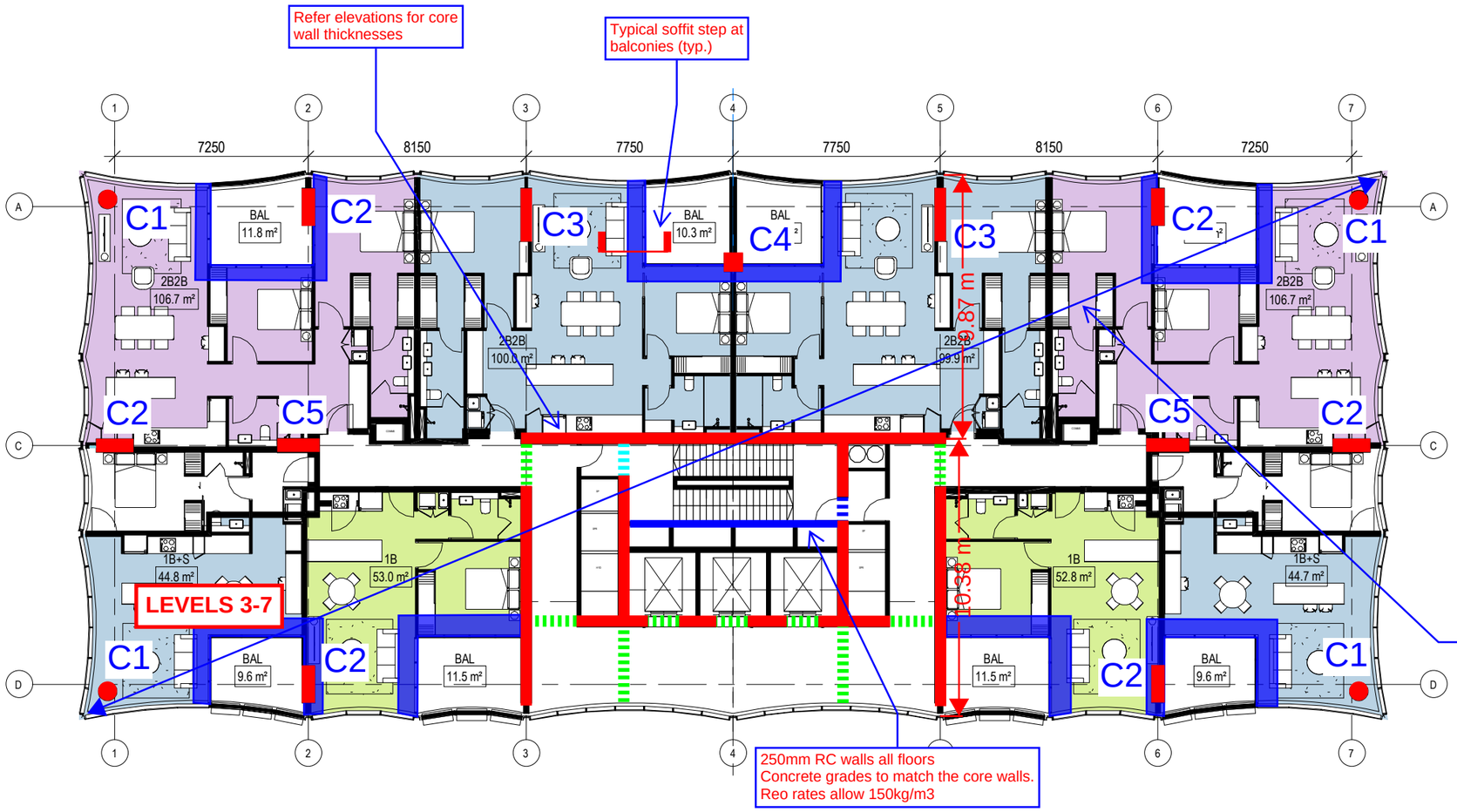
POOL LEVEL AND L25 TO PENTHOUSE LEVELS - PENDING LATEST ARCHI PLANS

NOTES:

1) This concept is based on architectural WIP drawings dated 12/11/2020.
2) Assumed FRL(mins):
   Carpark - 120/120/120
   Common area - 180/180/180
   Residential - 90/90/90
3) Assumed 30mm max setdown to wet areas.
4) PT and RC rates provided are based on prelim design and are approximate only - include trimmers, hairpins, cogs and antiburst (excl lapping) - to be used for cost estimating purposes only. Additional allowance of 30kg/m to be made for all folds to balcony setdowns on typical slabs. Final design to be undertaken by specialist PT contractor - Thickness and PT/RC rates may vary from what is shown herewith.
5) Concrete grade to all suspended slabs to be N40 UNO.



TYPICAL SOFFIT STEP DETAIL
AT BALCONIES FOR TYPICAL SLAB
(N.T.S)



TYPICAL FLOOR SLABS (N40)
1) RC OPTION - 275 thk SLAB
   Reo rates ~ 110kg/m3
2) PT OPTION - 230 thk SLAB
   Reo rates ~ 4.5kg/m2 PT
   ~ 40kg/m3 RC
   (230 thk PT slab will allow flat soffit across the wet area setdown)

1 / SK_0002 — **LEVELS 3-7** — 1 : 200

COLUMN SCHEDULE
***All columns above and below assumed to have centroid aligned**
***Allow 600-800mm deep capital where column profile and/or orientation changes at transition.**

TOWER COLUMNS
B2 to underside L12:
N80/N65 concrete typically UNO
- C1 - 750 dia circular column (reo rates allow 170kg/m3)
- C2 - 1400x550 column (reo rates allow 200kg/m3)
- C3 - 2000x500 megacolumn (N80, reo rates allow 170kg/m3)
- C4 - 800x800 column (reo rates allow 180kg/m3)
- C5 - 1500x600 column (reo rates allow 180kg/m3)

L12 to underside L24:
N65/N50 concrete typically UNO
- C1 - 550 dia circular column (reo rates allow 150kg/m3)
- C2 - 1400x350 column (reo rates allow 180kg/m3)
- C3 - (i) L12 to underside L20 - 2000x500 megacolumn (N80, reo rates allow 170kg/m3)
  (ii) L20 to underside L24 - 1400x300 column (reo rates allow 170kg/m3)
- C4 - 650x650 column (reo rates allow 180kg/m3)
- C5 - 1400x450 column (reo rates allow 180kg/m3)

L24 to Roof:
N50/N40 concrete typically UNO
- C1 - 400 dia circular column (reo rates allow 150kg/m3)
- C2 - 1200x275 column (reo rates allow 160kg/m3)
- C3 - 1200x275 column (reo rates allow 160kg/m3)
- C4 - 450x450 column (reo rates allow 220kg/m3)
- C5 - 1200x300 column (reo rates allow 150kg/m3)

HEADER BEAMS SCHEDULE

- 750mm deep header beam (typical on 3150mm high floors)
  950mm deep header beam (typical on 3300mm high floors)
- 1050mm deep header beam (typical on 3150mm high floors)
  1200mm deep header beam (typical on 3300mm high floors)
- 700mm deep header beam (typical on 3150mm high floors)
  800mm deep header beam (typical on 3300mm high floors)
  400mm deep zone has been allowed for services under these headers

CONSULTANT
Hassell
Hassell LTD ABN 24 007 711 435
Level 1
Commonwealth Bank Building
242 Murray Street
Perth WA 6000 Australia
T +61 8 6477 6000
perth@hassellstudio.com

REFERENCE

0m 1m 2m 3m

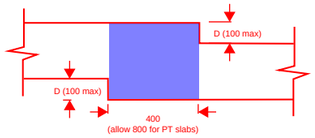
Stantec

SKETCH TITLE
88 Mill Point Road - preliminary structural concept

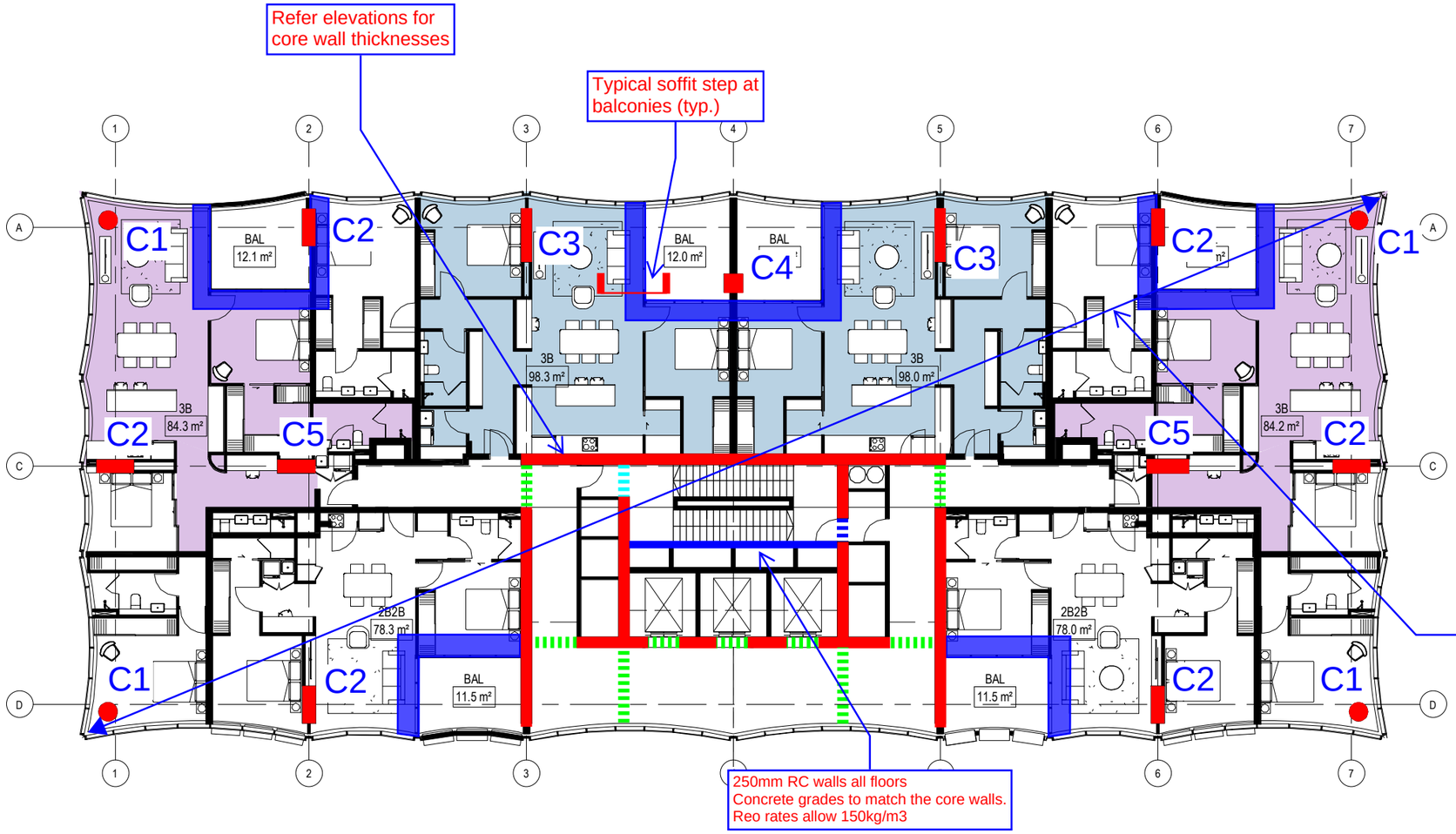
PROJECT No	SKETCH No	DATE	REV
301248278	SK012	16/11/2020	B

POOL LEVEL AND L25 TO PENTHOUSE LEVELS - PENDING LATEST ARCHI PLANS

NOTES:
1) This concept is based on architectural WIP drawings dated 12/11/2020.
2) Assumed FRL(mins):
   Carpark - 120/120/120
   Common area - 180/180/180
   Residential - 90/90/90
3) Assumed 30mm max setdown to wet areas.
4) PT and RC rates provided are based on prelim design and are approximate only - include trimmers, hairpins, cogs and antiburst (excl lapping) - to be used for cost estimating purposes only. Additional allowance of 30kg/m to be made for all folds to balcony setdowns on typical slabs. Final design to be undertaken by specialist PT contractor - Thickness and PT/RC rates may vary from what is shown herewith.
5) Concrete grade to all suspended slabs to be N40 UNO.



TYPICAL SOFFIT STEP DETAIL
AT BALCONIES FOR TYPICAL SLAB
(N.T.S)



TYPICAL FLOOR SLABS (N40)
1) RC OPTION - 275 thk SLAB
   Reo rates ~ 110kg/m3
2) PT OPTION - 230 thk SLAB
   Reo rates ~ 4.5kg/m2 PT
   ~ 40kg/m3 RC
   (230 thk PT slab will allow flat soffit across the wet area setdown)

1
SK_0002

LEVELS 8-18

1 : 200

COLUMN SCHEDULE
***All columns above and below assumed to have centroid aligned**
***Allow 600-800mm deep capital where column profile and/or orientation changes at transition.**

TOWER COLUMNS
B2 to underside L12:
N80/N65 concrete typically UNO
- C1 - 750 dia circular column (reo rates allow 170kg/m3)
- C2 - 1400x550 column (reo rates allow 200kg/m3)
- C3 - 2000x500 megacolumn (N80, reo rates allow 170kg/m3)
- C4 - 800x800 column (reo rates allow 180kg/m3)
- C5 - 1500x600 column (reo rates allow 180kg/m3)

L12 to underside L24:
N65/N50 concrete typically UNO
- C1 - 550 dia circular column (reo rates allow 150kg/m3)
- C2 - 1400x350 column (reo rates allow 180kg/m3)
- C3 - (i) L12 to underside L20 - 2000x500 megacolumn (N80, reo rates allow 170kg/m3)
  (ii) L20 to underside L24 - 1400x300 column (reo rates allow 170kg/m3)
- C4 - 650x650 column (reo rates allow 180kg/m3)
- C5 - 1400x450 column (reo rates allow 180kg/m3)

L24 to Roof:
N50/N40 concrete typically UNO
- C1 - 400 dia circular column (reo rates allow 150kg/m3)
- C2 - 1200x275 column (reo rates allow 160kg/m3)
- C3 - 1200x275 column (reo rates allow 160kg/m3)
- C4 - 450x450 column (reo rates allow 220kg/m3)
- C5 - 1200x300 column (reo rates allow 150kg/m3)

HEADER BEAMS SCHEDULE

750mm deep header beam (typical on 3150mm high floors)
950mm deep header beam (typical on 3300mm high floors)

1050mm deep header beam (typical on 3150mm high floors)
1200mm deep header beam (typical on 3300mm high floors)

700mm deep header beam (typical on 3150mm high floors)
800mm deep header beam (typical on 3300mm high floors)
400mm deep zone has been allowed for services under these headers

CONSULTANT
Hassell
Hassell LTD ABN 24 007 711 435
Level 1
Commonwealth Bank Building
242 Murray Street
Perth WA 6000 Australia
T +61 8 6477 6000
perth@hassellstudio.com

REFERENCE

0m 1m 2m 3m

Stantec

SKETCH TITLE

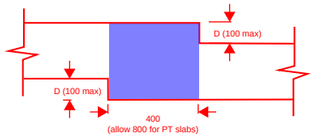
88 Mill Point Road - preliminary structural concept

301248278	SK013	16/11/2020	B
PROJECT No	SKETCH No	DATE	REV

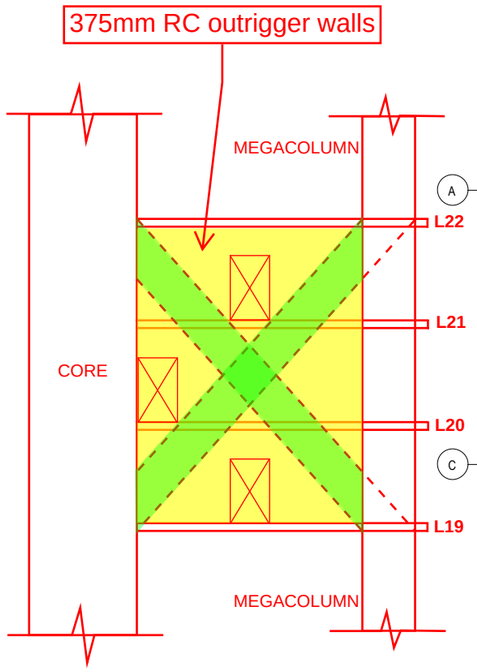
POOL LEVEL AND L25 TO PENTHOUSE LEVELS - PENDING LATEST ARCHI PLANS

NOTES:

1) This concept is based on architectural WIP drawings dated 12/11/2020.
2) Assumed FRL(mins):
   Carpark - 120/120/120
   Common area - 180/180/180
   Residential - 90/90/90
3) Assumed 30mm max setdown to wet areas.
4) PT and RC rates provided are based on prelim design and are approximate only - include trimmers, hairpins, cogs and antiburst (excl lapping) - to be used for cost estimating purposes only. Additional allowance of 30kg/m to be made for all folds to balcony setdowns on typical slabs. Final design to be undertaken by specialist PT contractor - Thickness and PT/RC rates may vary from what is shown herewith.
5) Concrete grade to all suspended slabs to be N40 UNO.

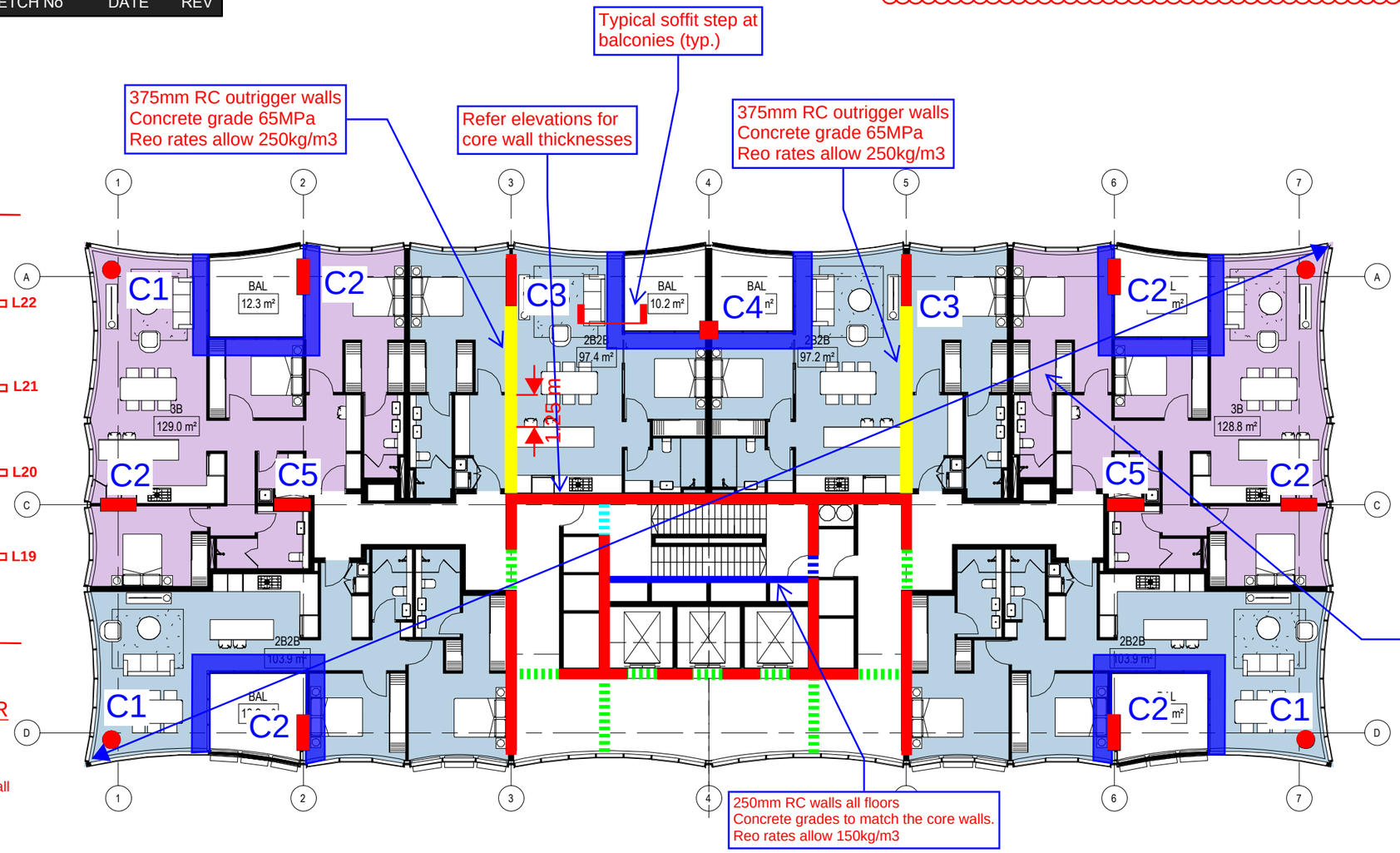


TYPICAL SOFFIT STEP DETAIL
AT BALCONIES FOR TYPICAL SLAB
(N.T.S)



ELEVATIONS OF OUTRIGGER WALLS AT GRID 3 and 5

*Alternate the openings across the outrigger wall to avoid the no-go zone shown green hatch



TYPICAL FLOOR SLABS (N40)

1) RC OPTION - 275 thk SLAB
   Reo rates ~ 110kg/m3
2) PT OPTION - 230 thk SLAB
   Reo rates ~ 4.5kg/m2 PT
   ~ 40kg/m3 RC
   (230 thk PT slab will allow flat soffit across the wet area setdown)

1
SK_0002

LEVELS 19-21
Outrigger levels

1 : 200

COLUMN SCHEDULE

***All columns above and below assumed to have centroid aligned**
***Allow 600-800mm deep capital where column profile and/or orientation changes at transition.**

TOWER COLUMNS

B2 to underside L12:

N80/N65 concrete typically UNO
- C1 - 750 dia circular column (reo rates allow 170kg/m3)
- C2 - 1400x550 column (reo rates allow 200kg/m3)
- C3 - 2000x500 megacolumn (N80, reo rates allow 170kg/m3)
- C4 - 800x800 column (reo rates allow 180kg/m3)
- C5 - 1500x600 column (reo rates allow 180kg/m3)

L12 to underside L24:

N65/N50 concrete typically UNO
- C1 - 550 dia circular column (reo rates allow 150kg/m3)
- C2 - 1400x350 column (reo rates allow 180kg/m3)
- C3 - (i) L12 to underside L20 - 2000x500 megacolumn (N80, reo rates allow 170kg/m3)
  (ii) L20 to underside L24 - 1400x300 column (reo rates allow 170kg/m3)
- C4 - 650x650 column (reo rates allow 180kg/m3)
- C5 - 1400x450 column (reo rates allow 180kg/m3)

L24 to Roof:

N50/N40 concrete typically UNO
- C1 - 400 dia circular column (reo rates allow 150kg/m3)
- C2 - 1200x275 column (reo rates allow 160kg/m3)
- C3 - 1200x275 column (reo rates allow 160kg/m3)
- C4 - 450x450 column (reo rates allow 220kg/m3)
- C5 - 1200x300 column (reo rates allow 150kg/m3)

HEADER BEAMS SCHEDULE

- 750mm deep header beam (typical on 3150mm high floors)
  950mm deep header beam (typical on 3300mm high floors)
- 1050mm deep header beam (typical on 3150mm high floors)
  1200mm deep header beam (typical on 3300mm high floors)
- 700mm deep header beam (typical on 3150mm high floors)
  800mm deep header beam (typical on 3300mm high floors)
  400mm deep zone has been allowed for services under these headers

CONSULTANT

Hassell

Hassell LTD ABN 24 007 711 435
Level 1
Commonwealth Bank Building
242 Murray Street
Perth WA 6000 Australia
T +61 8 6477 6000
perth@hassellstudio.com

REFERENCE **NORT**

0m 1m 2m 3m

Stantec

SKETCH TITLE

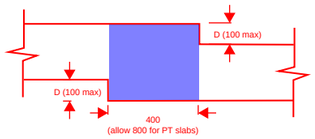
88 Mill Point Road - preliminary structural concept

PROJECT No	SKETCH No	DATE	REV
301248278	SK014	16/11/2020	B

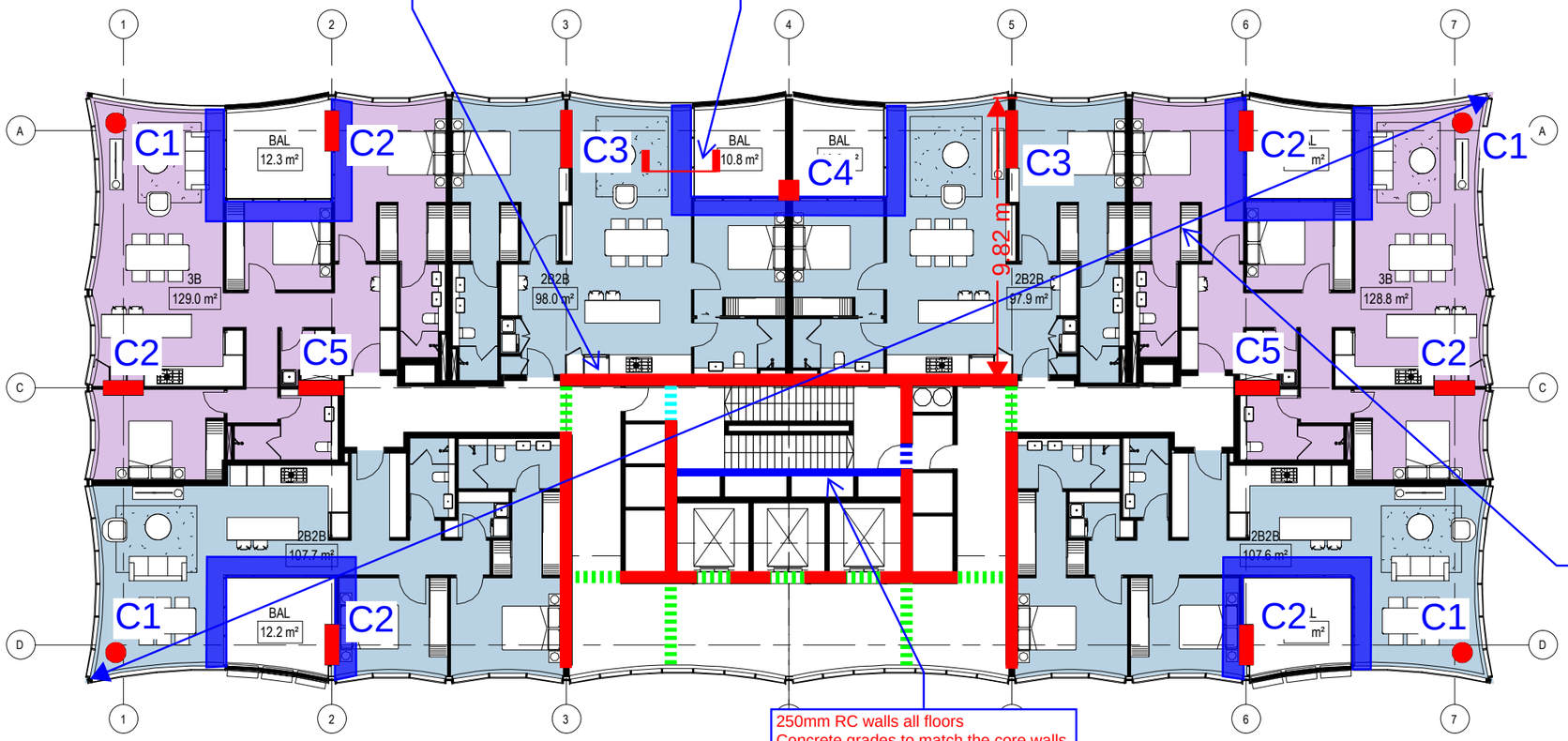
POOL LEVEL AND L25 TO PENTHOUSE LEVELS - PENDING LATEST ARCHI PLANS

NOTES:

1) This concept is based on architectural WIP drawings dated 12/11/2020.
2) Assumed FRL(mins):
   Carpark - 120/120/120
   Common area - 180/180/180
   Residential - 90/90/90
3) Assumed 30mm max setdown to wet areas.
4) PT and RC rates provided are based on prelim design and are approximate only - include trimmers, hairpins, cogs and antiburst (excl lapping) - to be used for cost estimating purposes only. Additional allowance of 30kg/m to be made for all folds to balcony setdowns on typical slabs. Final design to be undertaken by specialist PT contractor - Thickness and PT/RC rates may vary from what is shown herewith.
5) Concrete grade to all suspended slabs to be N40 UNO.



TYPICAL SOFFIT STEP DETAIL
AT BALCONIES FOR TYPICAL SLAB
(N.T.S)



TYPICAL FLOOR SLABS (N40)

1) RC OPTION - 275 thk SLAB
   Reo rates ~ 110kg/m3
2) PT OPTION - 230 thk SLAB
   Reo rates ~ 4.5kg/m2 PT
   ~ 40kg/m3 RC
   (230 thk PT slab will allow flat soffit across the wet area setdown)

1 / SK_0002 — **LEVELS 22-24** — 1 : 200

COLUMN SCHEDULE

***All columns above and below assumed to have centroid aligned**
***Allow 600-800mm deep capital where column profile and/or orientation changes at transition.**

TOWER COLUMNS

B2 to underside L12:

N80/N65 concrete typically UNO
- C1 - 750 dia circular column (reo rates allow 170kg/m3)
- C2 - 1400x550 column (reo rates allow 200kg/m3)
- C3 - 2000x500 megacolumn (N80, reo rates allow 170kg/m3)
- C4 - 800x800 column (reo rates allow 180kg/m3)
- C5 - 1500x600 column (reo rates allow 180kg/m3)

L12 to underside L24:

N65/N50 concrete typically UNO
- C1 - 550 dia circular column (reo rates allow 150kg/m3)
- C2 - 1400x350 column (reo rates allow 180kg/m3)
- C3 - (i) L12 to underside L20 - 2000x500 megacolumn (N80, reo rates allow 170kg/m3)
  (ii) L20 to underside L24 - 1400x300 column (reo rates allow 170kg/m3)
- C4 - 650x650 column (reo rates allow 180kg/m3)
- C5 - 1400x450 column (reo rates allow 180kg/m3)

L24 to Roof:

N50/N40 concrete typically UNO
- C1 - 400 dia circular column (reo rates allow 150kg/m3)
- C2 - 1200x275 column (reo rates allow 160kg/m3)
- C3 - 1200x275 column (reo rates allow 160kg/m3)
- C4 - 450x450 column (reo rates allow 220kg/m3)
- C5 - 1200x300 column (reo rates allow 150kg/m3)

HEADER BEAMS SCHEDULE

- 750mm deep header beam (typical on 3150mm high floors)
  950mm deep header beam (typical on 3300mm high floors)
- 1050mm deep header beam (typical on 3150mm high floors)
  1200mm deep header beam (typical on 3300mm high floors)
- 700mm deep header beam (typical on 3150mm high floors)
  800mm deep header beam (typical on 3300mm high floors)
  400mm deep zone has been allowed for services under these headers

CONSULTANT

Hassell

Hassell LTD ABN 24 007 711 435
Level 1
Commonwealth Bank Building
242 Murray Street
Perth WA 6000 Australia
T +61 8 6477 6000
perth@hassellstudio.com

REFERENCE **NORT**

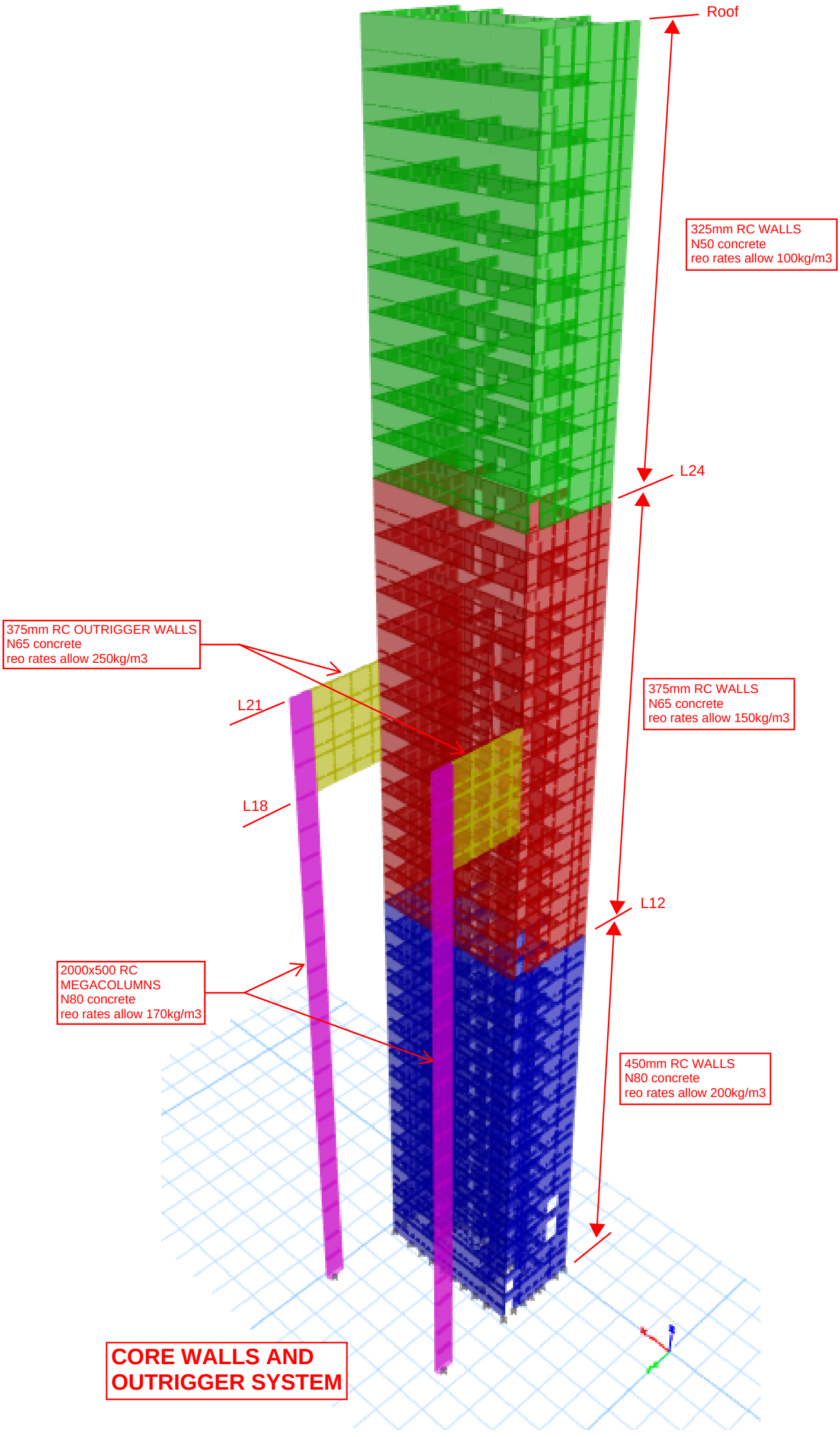
0m 1m 2m 3m

Stantec

SKETCH TITLE

88 Mill Point Road - preliminary structural concept

PROJECT No	SKETCH No	DATE	REV
301248278	SK015	16/11/2020	B



Appendix B
Water Information Reporting Data

Government of Western Australia
Department of Water and Environmental Regulation

ROYALTIES FOR REGIONS

Water Information Reporting

Site Filter (119263 available/14 selected)

Site Category: Groundwater

Filtering Criteria Show Advanced

Keyword:

Data Category: All

Variable Type: All

Telemetered: All

Owner: All

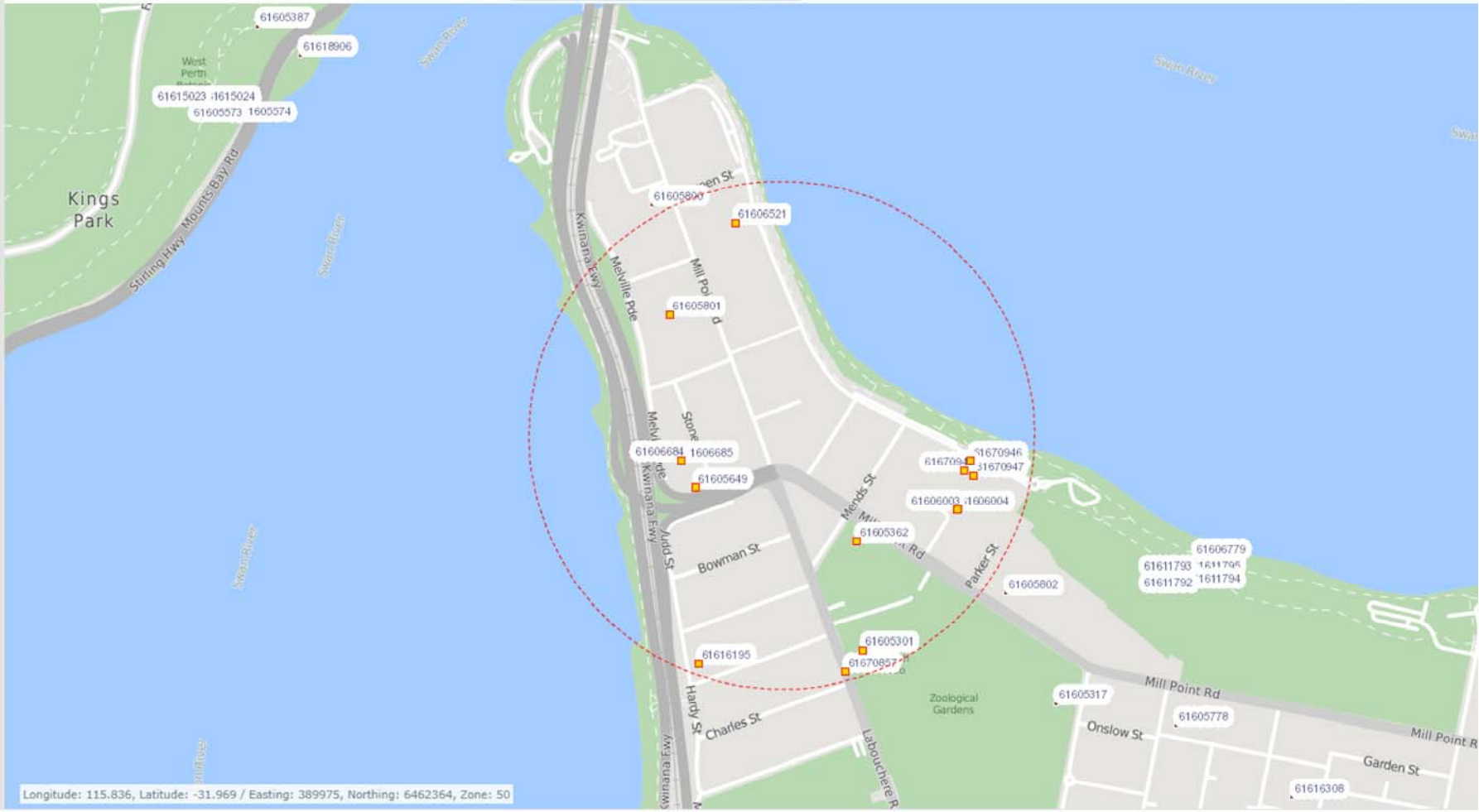
Apply | Clear

Site Cart (14 sites selected)

Site Ref

- 61605301 (Swan Coastal Catchment 616 - Zoo Artesian No 1 - Zoo Artesian No 1)
- 61605362 (Swan Coastal Catchment 616 - (315) Windsor Park - (315) Windsor Park)
- 61605649 (Swan Coastal Catchment 616 - Stone St - Stone St)
- 61605801 (Swan Coastal Catchment 616 - Bore - Bore)
- 61606003 (Swan Coastal Catchment 616 - No1 - No1)
- 61606004 (Swan Coastal Catchment 616 - No2 - No2)
- 61606521 (Swan Coastal Catchment 616 - Bore - Bore)
- 61606684 (Swan Coastal Catchment 616 - Bore - Bore)
- 61606685 (Swan Coastal Catchment 616 - Bore - Bore)
- 61616195 (Swan Coastal Catchment 616 - Bore - Bore)
- 61670857 (South Perth - Company - Company)
- 61670945 (South Perth - MB1 - MB1)
- 61670946 (South Perth - Private Mb2 - Private Mb2)
- 61670947 (South Perth - Private Mb3 - Private Mb3)

Quick Help | Find place



Longitude: 115.836, Latitude: -31.969 / Easting: 389975, Northing: 6462364, Zone: 50

Government of **Western Australia**
Department of **Water and Environmental Regulation**

Site Details Report

Date: *08/12/2020*

Site reference 61605301 - Swan Coastal Catchment 616 - Zoo Artesian No 1 - Zoo Artesian No 1

Alternative Site References

Numbering System	Reference Code	Site Name	Short Name
AWRC	61605301	Swan Coastal Catchment 616 - Zoo Artesian No 1	Zoo Artesian No 1
WIN_ID	20028927		Zoo Artesian No 1
AQWAB	2034-2-SW-0021	SWAN COASTAL CATCHMENT 616 - ZOO ARTESIAN NO 1	Zoo Artesian No 1

General Details

Site Type	Groundwater	**Sub Type**	Bore or Well	**Site Geofeature**	Ground
Northing	6461689	**Easting**	391564	**Zone**	50
Latitude	-31.975642582	**Longitude**	115.852323723	**Spheroid**	GDA94
Thou250 Map Index	SH5014	**Geographic Precision (+/- m)**	+/-100m		
Local Govt Authority	CITY OF SOUTH PERTH	**Locality**	SOUTH PERTH	**DWER Region**	Swan-Avon
Catchment	SwanAvon_Lower Swan	**Estuary**		**BOM Rainfall District**	9 - Central Coast
River Basin	616 - Swan Coastal	**Groundwater Area**	Perth	**Groundwater Province**	Perth
Surface Water Area	Swan River and Tributaries	**Surface Water SubArea**	Swan/Canning Estuary	**GgStn Catchment Area (km2)**	N/A
Site Comment	8/6/84 bore has been backfilled since casing corroded to unsafe condition. Elevation originally: rl 18ft asl. Water at 1614ft flow 40,000 gpd; at 1634ft increased to 70,000 gpd; static head 46ft asl, increased supply at 1837ft; flow on completion 375,000 gpd; principal water bearing horizon 1837ft; static head 103ft. 157-1632ft kings park shale, 1632-1860 south perth shale, 1860+ yarragadee formation. Metro water states (1962) flow 180,000 gpd.				

Depth Measurement Points (*Site reference: 61605301)*

Measurement Point Type	Elevation (m as per Datum Plane)	Datum	Measurement Method	Date	Comments
Ground level	5.49	AHD	(none)	30/06/1899	

Drilling - No Data Available

Site Details Report

Date: *08/12/2020*

Borehole Information (*Site reference: 61605301)*

Completed Date	30/06/1899	**Drill Method Name**	Unknown		
Owner Name	Perth Zoological Gardens	**Drill Rig Name**	Unknown		
Drill Company Name	Davis Hankinson Drilling	**Total Construction Depth (mbGL)**	0	**Depth Drilled (mbGL)**	567.08
Comments					

Casing (*Site reference: 61605301)*

From (mbGL)	To (mbGL)	Element	Material	Inlet Type	Inside Dia. (mm)	Outside Dia. (mm)	Aperture (mm)	Comments
0.000	0.000	Unknown	Unknown	Not applicable				0-79ft9in x 10in FJ, 0-342ft x 8in FJ, 0-488ft x 6in SJ, 1531-1534ft x 5in SJ, 1638-1688ft5in x 5in SJ, 1534-1845 x 4in FJ.

Fill - No Data Available

Aquifers - No Data Available

Lithology Log *(Site reference: 61605301)*

From (mbGL)	To (mbGL)	Interpreted By	Substance	Lithological Description
0.000	22.860	Non geologist--Unknown Org Type		Yellow drift sand.
22.860	47.850	Non geologist--Unknown Org Type		Shell marl.
47.850	66.140	Non geologist--Unknown Org Type		Calcareous shale.
66.140	146.300	Non geologist--Unknown Org Type		Sand.
146.300	146.430	Non geologist--Unknown Org Type		Very hard band of sandstone.
146.430	361.800	Non geologist--Unknown Org Type		Shell marl.
361.800	491.950	Non geologist--Unknown Org Type		Calcareous shale.
491.950	497.430	Non geologist--Unknown Org Type		Mudstone.
497.430	512.370	Non geologist--Unknown Org Type		Calcareous shale.
512.370	520.900	Non geologist--Unknown Org Type		Mudstone.
520.900	533.400	Non geologist--Unknown Org Type		Calcareous shale.
533.400	538.280	Non geologist--Unknown Org Type		Dark clayey and sandy shales with shell fossils.
538.280	558.090	Non geologist--Unknown Org Type		Mudstone.
558.090	562.970	Non geologist--Unknown Org Type		Soft sandstone.
562.970	567.080	Non geologist--Unknown Org Type		Sandstone with hard bands.

Stratigraphy Log *(Site reference: 61605301)*

From (mbGL)	To (mbGL)	Interpreted By	Interpreted Date	Stratigraphy	Lithology1	Lithology2	Lithology3
0.000	22.860	Non geologist--Unknown Org Type	23/09/1996	Quaternary	sand	(none)	(none)
22.860	47.850	Non geologist--Unknown Org Type	23/09/1996	? Quaternary+Tertiary	marl	shells	(none)
47.850	298.700	Non geologist--Unknown Org Type	23/09/1996	? Kings Park Fm	marl	shale	sand
298.700	451.100	Non geologist--Unknown Org Type	23/09/1996	? Leederville Fm	marl	shale	(none)
451.100	502.920	Non geologist--Unknown Org Type	23/09/1996	? South Perth Shl	shale	calcareous	mudstone
502.920	567.080	Non geologist--Unknown Org Type	23/09/1996	? Gage Fm	shale	mudstone	sandstone

Advanced Data Summary (*Site reference: 61605301 WIN Site ID: 61605301)*

Readings by Project

Default Site Reference	Project Code	Project Name	First Measurement	Last Measurement	No of Measurements
61605301	WA-G-PRE1996AQWADATA	Pre 1996 AQWABase Data Capture	30/06/1899	30/06/1962	3

Readings by Data Category

Default Site Reference	Data Category	First Measurement	Last Measurement	No of Measurements
61605301	Water levels - discrete	30/06/1899	30/06/1962	3

Readings By Variable Type

Default Site Reference	Variable Type	First Measurement	Last Measurement	No of Measurements
61605301	Water Level (discrete)	30/06/1899	30/06/1962	3

Site Details Report

Date: 08/12/2020

Site reference 61605362 - Swan Coastal Catchment 616 - (315) Windsor Park - (315) Windsor Park

Alternative Site References

Numbering System	Reference Code	Site Name	Short Name
AWRC	61605362	Swan Coastal Catchment 616 - (315) Windsor Park	(315) Windsor Park
WIN_ID	20029007		(315) Windsor Park
AQWAB	2034-2-SW-0101	SWAN COASTAL CATCHMENT 616 - (315) WINDSOR PARK	(315) Windsor Park

General Details

Site Type	Groundwater	**Sub Type**	Bore or Well	**Site Geofeature**	Ground
Northing	6461903	**Easting**	391550	**Zone**	50
Latitude	-31.973710951	**Longitude**	115.852199602	**Spheroid**	GDA94
Thou250 Map Index	SH5014	**Geographic Precision (+/- m)**	+/-100m		
Local Govt Authority	CITY OF SOUTH PERTH	**Locality**	SOUTH PERTH	**DWER Region**	Swan-Avon
Catchment	SwanAvon_Lower Swan	**Estuary**		**BOM Rainfall District**	9 - Central Coast
River Basin	616 - Swan Coastal	**Groundwater Area**	Perth	**Groundwater Province**	Perth
Surface Water Area	Swan River and Tributaries	**Surface Water SubArea**	Swan/Canning Estuary	**GgStn Catchment Area(km2)**	N/A
Site Comment	Elevation originally: approx. Centrifugal pump; well first 12ft. Depth originally: nr and also recorded as: well 8ft, bore 35ft, total depth 43ft.				

Depth Measurement Points (*Site reference: 61605362)*

Measurement Point Type	Elevation (m as per Datum Plane)	Datum	Measurement Method	Date	Comments
Ground level	6.82	AHD	(none)	01/01/1900	

Drilling - No Data Available

Borehole Information (*Site reference: 61605362)*

Completed Date	1/01/1900	**Drill Method Name**	Unknown		
Owner Name	City of South Perth	**Drill Rig Name**	Unknown		
Drill Company Name	Unknown Company	**Total Construction Depth (mbGL)**	0	**Depth Drilled (mbGL)**	13.11
Comments					

Casing (*Site reference: 61605362)*

From (mbGL)	To (mbGL)	Element	Material	Inlet Type	Inside Dia. (mm)	Outside Dia. (mm)	Aperture (mm)	Comments
0.000	0.000	Unknown	Unknown	Not applicable				21ft spear.

Fill - No Data Available

Aquifers - No Data Available

Lithology Log - No Data Available

Stratigraphy Log - No Data Available

Advanced Data Summary (*Site reference: 61605362 WIN Site ID: 61605362)*

Readings by Project

Default Site Reference	Project Code	Project Name	First Measurement	Last Measurement	No of Measurements
61605362	SG-G-BCPERTH	Bore Census - Perth - for AQWABase	22/09/1971	22/09/1971	7

Readings by Data Category

Default Site Reference	Data Category	First Measurement	Last Measurement	No of Measurements
61605362	Water quality indicators - discrete	22/09/1971	22/09/1971	7

Readings By Variable Type

Default Site Reference	Variable Type	First Measurement	Last Measurement	No of Measurements
61605362	Inorganic metals	22/09/1971	22/09/1971	1
61605362	Physical	22/09/1971	22/09/1971	6

Site Details Report

Date: 08/12/2020

Site reference 61605649 - Swan Coastal Catchment 616 - Stone St - Stone St

Alternative Site References

Numbering System	Reference Code	Site Name	Short Name
AWRC	61605649	Swan Coastal Catchment 616 - Stone St	Stone St
WIN_ID	20029340		Stone St
AQWAB	2034-2-SW-0434	SWAN COASTAL CATCHMENT 616 - STONE ST	Stone St

General Details

Site Type	Groundwater	**Sub Type**	Bore or Well	**Site Geofeature**	Ground
Northing	6462006	**Easting**	391230	**Zone**	50
Latitude	-31.972751215	**Longitude**	115.848824979	**Spheroid**	GDA94
Thou250 Map Index	SH5014	**Geographic Precision (+/- m)**	+/-100m		
Local Govt Authority	CITY OF SOUTH PERTH	**Locality**	SOUTH PERTH	**DWER Region**	Swan-Avon
Catchment	SwanAvon_Lower Swan	**Estuary**		**BOM Rainfall District**	9 - Central Coast
River Basin	616 - Swan Coastal	**Groundwater Area**	Perth	**Groundwater Province**	Perth
Surface Water Area	Swan River and Tributaries	**Surface Water SubArea**	Swan/Canning Estuary	**GgStn Catchment Area (km2)**	N/A
Site Comment	Elevation recorded as: approx. Pumped 24 yielding 20 000 gph the 1st 11 hrs dropping to 10 700 gph for approx 3 hrs, increasing to 151 00 gph. Overall d/d approx 1m. Salinity increased from 2400 mg/L at start of test to 5900 mg/L after 24 hours.				

Depth Measurement Points (*Site reference: 61605649)*

Measurement Point Type	Elevation (m as per Datum Plane)	Datum	Measurement Method	Date	Comments
Ground level	1.5	AHD	(none)	30/06/1975	

Drilling - No Data Available

Borehole Information (*Site reference: 61605649)*

Completed Date	30/06/1975	**Drill Method Name**	Unknown		
Owner Name	Department of Main Roads	**Drill Rig Name**	Unknown		
Drill Company Name	Unknown Company	**Total Construction Depth (mbGL)**	23.8	**Depth Drilled (mbGL)**	23.8
Comments	How pump tested: Pumped 24 hrs				

Casing (*Site reference: 61605649)*

From (mbGL)	To (mbGL)	Element	Material	Inlet Type	Inside Dia. (mm)	Outside Dia. (mm)	Aperture (mm)	Comments
0.000	0.000	Unknown	Unknown	Not applicable				16.18 x 150mm
16.180	23.800	Inlet (screen)	Unknown	Screen				

Fill - No Data Available

Aquifers - No Data Available

Lithology Log *(Site reference: 61605649)*

From (mbGL)	To (mbGL)	Interpreted By	Substance	Lithological Description
0.000	7.000	Non geologist--Unknown Org Type		White sand, fine.
7.000	10.300	Non geologist--Unknown Org Type		Clayey sand.
10.300	12.300	Non geologist--Unknown Org Type		White clayey sand.
12.300	14.300	Non geologist--Unknown Org Type		White clayey sand.
14.300	15.000	Non geologist--Unknown Org Type		White clayey sand.
15.000	16.000	Non geologist--Unknown Org Type		Fine yellow clayey sand.
16.000	16.300	Non geologist--Unknown Org Type		Fine yellow clayey sand.
16.300	18.000	Non geologist--Unknown Org Type		Fine yellow clayey sand.
18.000	18.300	Non geologist--Unknown Org Type		Brown clayey sand.
18.300	19.300	Non geologist--Unknown Org Type		Fine brown clayey sand.
19.300	20.000	Non geologist--Unknown Org Type		Brown clayey sand.
20.000	21.000	Non geologist--Unknown Org Type		Coffey rock.
21.000	21.300	Non geologist--Unknown Org Type		Coarse clayey sand and coffey rock.
21.300	21.600	Non geologist--Unknown Org Type		Coarse sand.
21.600	22.400	Non geologist--Unknown Org Type		Coarse brown clay.
22.400	23.800	Non geologist--Unknown Org Type		Not logged.

Stratigraphy Log *(Site reference: 61605649)*

From (mbGL)	To (mbGL)	Interpreted By	Interpreted Date	Stratigraphy	Lithology1	Lithology2	Lithology3
0.000	21.000	Non geologist--Unknown Org Type	3/09/1996	Quaternary+Tertiary	sand	clayey	coffee rock
21.000	22.400	Non geologist--Unknown Org Type	3/09/1996	? Quaternary+Tertiary	coarse sand	clay	coffee rock
22.400	23.800	Non geologist--Unknown Org Type	3/09/1996	Not Logged	(none)	(none)	(none)

Advanced Data Summary (*Site reference: 61605649 WIN Site ID: 61605649)*

Readings by Project

Default Site Reference	Project Code	Project Name	First Measurement	Last Measurement	No of Measurements
61605649	WA-G-PRE1996AQWADATA	Pre 1996 AQWABase Data Capture	30/06/1975	30/06/1975	4

Readings by Data Category

Default Site Reference	Data Category	First Measurement	Last Measurement	No of Measurements
61605649	Water levels - discrete	30/06/1975	30/06/1975	3
61605649	Water quality indicators - discrete	30/06/1975	30/06/1975	1

Readings By Variable Type

Default Site Reference	Variable Type	First Measurement	Last Measurement	No of Measurements
61605649	Physical	30/06/1975	30/06/1975	1
61605649	Water Level (discrete)	30/06/1975	30/06/1975	3

Site Details Report

Date: 08/12/2020

Site reference 61605801 - Swan Coastal Catchment 616 - Bore - Bore

Alternative Site References

Numbering System	Reference Code	Site Name	Short Name
AWRC	61605801	Swan Coastal Catchment 616 - Bore	Bore
WIN_ID	20029496		Bore
AQWAB	2034-2-SW-0590	SWAN COASTAL CATCHMENT 616 -	Bore

General Details

Site Type	Groundwater	**Sub Type**	Bore or Well	**Site Geofeature**	Ground
Northing	6462345	**Easting**	391175	**Zone**	50
Latitude	-31.969688131	**Longitude**	115.848281169	**Spheroid**	GDA94
Thou250 Map Index	SH5014	**Geographic Precision (+/- m)**	+/-100m		
Local Govt Authority	CITY OF SOUTH PERTH	**Locality**	SOUTH PERTH	**DWER Region**	Swan-Avon
Catchment	SwanAvon_Lower Swan	**Estuary**		**BOM Rainfall District**	9 - Central Coast
River Basin	616 - Swan Coastal	**Groundwater Area**	Perth	**Groundwater Province**	Perth
Surface Water Area	Swan River and Tributaries	**Surface Water SubArea**	Swan/Canning Estuary	**GgStn Catchment Area (km2)**	N/A
Site Comment	Depth originally: 26ft, 4ft.				

Depth Measurement Points (*Site reference: 61605801)*

Measurement Point Type	Elevation (m as per Datum Plane)	Datum	Measurement Method	Date	Comments
Ground level	0	NA	(none)	22/12/1977	

Drilling - No Data Available

Borehole Information (*Site reference: 61605801)*

Completed Date	22/12/1977	**Drill Method Name**	Unknown		
Owner Name	Freeway Hotel	**Drill Rig Name**	Unknown		
Drill Company Name	Hugall and Hoile	**Total Construction Depth (mbGL)**	7.92	**Depth Drilled (mbGL)**	7.92
Comments					

Casing (*Site reference: 61605801)*

From (mbGL)	To (mbGL)	Element	Material	Inlet Type	Inside Dia. (mm)	Outside Dia. (mm)	Aperture (mm)	Comments
4.880	7.920	Inlet (screen)	Unknown	Unknown			0.760	

Fill - No Data Available

Aquifers - No Data Available

Lithology Log *(Site reference: 61605801)*

From (mbGL)	To (mbGL)	Interpreted By	Substance	Lithological Description
0.000	4.880	Non geologist--Unknown Org Type		Fine-med. Light brown sand.
4.880	7.920	Non geologist--Unknown Org Type		Medium white sand.

Stratigraphy Log *(Site reference: 61605801)*

From (mbGL)	To (mbGL)	Interpreted By	Interpreted Date	Stratigraphy	Lithology1	Lithology2	Lithology3
0.000	7.920	Non geologist--Unknown Org Type	4/10/1996	Quaternary	sand	(none)	(none)

Advanced Data Summary (*Site reference: 61605801 WIN Site ID: 61605801)*

Readings by Project

Default Site Reference	Project Code	Project Name	First Measurement	Last Measurement	No of Measurements
61605801	WA-G-PRE1996AQWADATA	Pre 1996 AQWABase Data Capture	22/12/1977	22/12/1977	1

Readings by Data Category

Default Site Reference	Data Category	First Measurement	Last Measurement	No of Measurements
61605801	Water levels - discrete	22/12/1977	22/12/1977	1

Readings By Variable Type

Default Site Reference	Variable Type	First Measurement	Last Measurement	No of Measurements
61605801	Water Level (discrete)	22/12/1977	22/12/1977	1

Site Details Report

Date: 08/12/2020

Site reference 61606003 - Swan Coastal Catchment 616 - No1 - No1

Alternative Site References

Numbering System	Reference Code	Site Name	Short Name
AWRC	61606003	Swan Coastal Catchment 616 - No1	No1
WIN_ID	20029712		No1
AQWAB	2034-2-SW-0806	SWAN COASTAL CATCHMENT 616 - BORE NO. 1	No1

General Details

Site Type	Groundwater	**Sub Type**	Bore or Well	**Site Geofeature**	Ground
Northing	6461969	**Easting**	391749	**Zone**	50
Latitude	-31.973134651	**Longitude**	115.854312809	**Spheroid**	GDA94
Thou250 Map Index	SH5014	**Geographic Precision (+/- m)**	+/-100m		
Local Govt Authority	CITY OF SOUTH PERTH	**Locality**	SOUTH PERTH	**DWER Region**	Swan-Avon
Catchment	SwanAvon_Lower Swan	**Estuary**		**BOM Rainfall District**	9 - Central Coast
River Basin	616 - Swan Coastal	**Groundwater Area**	Perth	**Groundwater Province**	Perth
Surface Water Area	Swan River and Tributaries	**Surface Water SubArea**	Swan/Canning Estuary	**GgStn Catchment Area (km2)**	N/A
Site Comment	Developing hours: 2. Diam of bore : 4.5in.				

Depth Measurement Points (*Site reference: 61606003)*

Measurement Point Type	Elevation (m as per Datum Plane)	Datum	Measurement Method	Date	Comments
Ground level	0	NA	(none)	23/03/1978	

Drilling - No Data Available

Borehole Information (*Site reference: 61606003)*

Completed Date	23/03/1978	**Drill Method Name**	Unknown		
Owner Name	Darley Heights	**Drill Rig Name**	Unknown		
Drill Company Name	Western Irrigation Pty Ltd	**Total Construction Depth (mbGL)**	0	**Depth Drilled (mbGL)**	32
Comments					

Casing (*Site reference: 61606003)*

From (mbGL)	To (mbGL)	Element	Material	Inlet Type	Inside Dia. (mm)	Outside Dia. (mm)	Aperture (mm)	Comments
0.000	0.000	Unknown	Unknown	Not applicable				Slot/perf/scr: length 5ft (cusil bronze), diam 4in, aperture 0.20in

Fill - No Data Available

Aquifers - No Data Available

Lithology Log *(Site reference: 61606003)*

From (mbGL)	To (mbGL)	Interpreted By	Substance	Lithological Description
0.000	10.670	Non geologist--Unknown Org Type		Sand
10.670	32.000	Non geologist--Unknown Org Type		Sand bars - small thick strata of clay

Stratigraphy Log *(Site reference: 61606003)*

From (mbGL)	To (mbGL)	Interpreted By	Interpreted Date	Stratigraphy	Lithology1	Lithology2	Lithology3
0.000	32.000	Non geologist--Unknown Org Type	9/10/1996	Quaternary	sand	clay	(none)

Advanced Data Summary (*Site reference: 61606003 WIN Site ID: 61606003)*

Readings by Project

Default Site Reference	Project Code	Project Name	First Measurement	Last Measurement	No of Measurements
61606003	WA-G-PRE1996AQWADATA	Pre 1996 AQWABase Data Capture	23/03/1978	23/03/1978	2

Readings by Data Category

Default Site Reference	Data Category	First Measurement	Last Measurement	No of Measurements
61606003	Water levels - discrete	23/03/1978	23/03/1978	2

Readings By Variable Type

Default Site Reference	Variable Type	First Measurement	Last Measurement	No of Measurements
61606003	Water Level (discrete)	23/03/1978	23/03/1978	2

Site Details Report

Date: 08/12/2020

Site reference 61606004 - Swan Coastal Catchment 616 - No2 - No2

Alternative Site References

Numbering System	Reference Code	Site Name	Short Name
AWRC	61606004	Swan Coastal Catchment 616 - No2	No2
WIN_ID	20029713		No2
AQWAB	2034-2-SW-0807	SWAN COASTAL CATCHMENT 616 - BORE NO. 2	No2

General Details

Site Type	Groundwater	**Sub Type**	Bore or Well	**Site Geofeature**	Ground
Northing	6461968	**Easting**	391748	**Zone**	50
Latitude	-31.973143575	**Longitude**	115.854302115	**Spheroid**	GDA94
Thou250 Map Index	SH5014	**Geographic Precision (+/- m)**	+/-100m		
Local Govt Authority	CITY OF SOUTH PERTH	**Locality**	SOUTH PERTH	**DWER Region**	Swan-Avon
Catchment	SwanAvon_Lower Swan	**Estuary**		**BOM Rainfall District**	9 - Central Coast
River Basin	616 - Swan Coastal	**Groundwater Area**	Perth	**Groundwater Province**	Perth
Surface Water Area	Swan River and Tributaries	**Surface Water SubArea**	Swan/Canning Estuary	**GgStn Catchment Area (km2)**	N/A
Site Comment	Developing hours : 2. Diam of bore: 4.5in				

Depth Measurement Points (*Site reference: 61606004)*

Measurement Point Type	Elevation (m as per Datum Plane)	Datum	Measurement Method	Date	Comments
Ground level	0	NA	(none)	23/03/1978	

Drilling - No Data Available

Borehole Information (*Site reference: 61606004)*

Completed Date	23/03/1978	**Drill Method Name**	Unknown		
Owner Name	Darley Heights	**Drill Rig Name**	Unknown		
Drill Company Name	Western Irrigation Pty Ltd	**Total Construction Depth (mbGL)**	0	**Depth Drilled (mbGL)**	21.34
Comments					

Casing (*Site reference: 61606004)*

From (mbGL)	To (mbGL)	Element	Material	Inlet Type	Inside Dia. (mm)	Outside Dia. (mm)	Aperture (mm)	Comments
0.000	0.000	Unknown	Unknown	Not applicable				Slot/perf/scr: length 5ft (cusil bronze), diam 4in, aperture 0.20in

Fill - No Data Available

Aquifers - No Data Available

Lithology Log *(Site reference: 61606004)*

From (mbGL)	To (mbGL)	Interpreted By	Substance	Lithological Description
0.000	10.670	Non geologist--Unknown Org Type		Yellow sand
10.670	12.190	Non geologist--Unknown Org Type		Clay
12.190	21.340	Non geologist--Unknown Org Type		Very coarse sand small clay bits and very thin clay bars

Stratigraphy Log *(Site reference: 61606004)*

From (mbGL)	To (mbGL)	Interpreted By	Interpreted Date	Stratigraphy	Lithology1	Lithology2	Lithology3
0.000	21.340	Non geologist--Unknown Org Type	9/10/1996	Quaternary	coarse sand	sand	clay

Advanced Data Summary (*Site reference: 61606004 WIN Site ID: 61606004)*

Readings by Project

Default Site Reference	Project Code	Project Name	First Measurement	Last Measurement	No of Measurements
61606004	WA-G-PRE1996AQWADATA	Pre 1996 AQWABase Data Capture	23/03/1978	23/03/1978	2

Readings by Data Category

Default Site Reference	Data Category	First Measurement	Last Measurement	No of Measurements
61606004	Water levels - discrete	23/03/1978	23/03/1978	2

Readings By Variable Type

Default Site Reference	Variable Type	First Measurement	Last Measurement	No of Measurements
61606004	Water Level (discrete)	23/03/1978	23/03/1978	2

Site Details Report

Date: 08/12/2020

Site reference 61606521 - Swan Coastal Catchment 616 - Bore - Bore

Alternative Site References

Numbering System	Reference Code	Site Name	Short Name
AWRC	61606521	Swan Coastal Catchment 616 - Bore	Bore
WIN_ID	20030365		Bore
AQWAB	2034-2-SW-1459	SWAN COASTAL CATCHMENT 616 -	Bore

General Details

Site Type	Groundwater	**Sub Type**	Bore or Well	**Site Geofeature**	Ground
Northing	6462528	**Easting**	391303	**Zone**	50
Latitude	-31.968049744	**Longitude**	115.849656189	**Spheroid**	GDA94
Thou250 Map Index	SH5014	**Geographic Precision (+/- m)**	+/-100m		
Local Govt Authority	CITY OF SOUTH PERTH	**Locality**	SOUTH PERTH	**DWER Region**	Swan-Avon
Catchment	SwanAvon_Lower Swan	**Estuary**	Swan River	**BOM Rainfall District**	9 - Central Coast
River Basin	616 - Swan Coastal	**Groundwater Area**	Perth	**Groundwater Province**	Perth
Surface Water Area	Swan River and Tributaries	**Surface Water SubArea**	Swan/Canning Estuary	**GgStn Catchment Area (km2)**	N/A
Site Comment	Quality also recorded as: 50.0. Supply originally recorded as; using 3 hp centrifugal approx 3500 gph.				

Depth Measurement Points (*Site reference: 61606521)*

Measurement Point Type	Elevation (m as per Datum Plane)	Datum	Measurement Method	Date	Comments
Ground level	0	NA	(none)	05/05/1979	

Drilling - No Data Available

Borehole Information (*Site reference: 61606521)*

Completed Date	5/05/1979	**Drill Method Name**	Unknown		
Owner Name	Private Owner	**Drill Rig Name**	Unknown		
Drill Company Name	Water Well Reticulation	**Total Construction Depth (mbGL)**	0	**Depth Drilled (mbGL)**	11.58
Comments					

Casing (*Site reference: 61606521)*

From (mbGL)	To (mbGL)	Element	Material	Inlet Type	Inside Dia. (mm)	Outside Dia. (mm)	Aperture (mm)	Comments
0.000	0.000	Unknown	Unknown	Not applicable				No casing. PVC frame, s/s mesh - 10ft.

Fill - No Data Available

Aquifers - No Data Available

Lithology Log - No Data Available

Stratigraphy Log - No Data Available

Advanced Data Summary (*Site reference: 61606521 WIN Site ID: 61606521)*

Readings by Project

Default Site Reference	Project Code	Project Name	First Measurement	Last Measurement	No of Measurements
61606521	WA-G-PRE1996AQWADATA	Pre 1996 AQWABase Data Capture	5/05/1979	5/05/1979	3

Readings by Data Category

Default Site Reference	Data Category	First Measurement	Last Measurement	No of Measurements
61606521	Water levels - discrete	5/05/1979	5/05/1979	2
61606521	Water quality indicators - discrete	5/05/1979	5/05/1979	1

Readings By Variable Type

Default Site Reference	Variable Type	First Measurement	Last Measurement	No of Measurements
61606521	Physical	5/05/1979	5/05/1979	1
61606521	Water Level (discrete)	5/05/1979	5/05/1979	2

Site Details Report

Date: 08/12/2020

Site reference 61606684 - Swan Coastal Catchment 616 - Bore - Bore

Alternative Site References

Numbering System	Reference Code	Site Name	Short Name
AWRC	61606684	Swan Coastal Catchment 616 - Bore	Bore
WIN_ID	20030585		Bore
AQWAB	2034-2-SW-1679	SWAN COASTAL CATCHMENT 616 -	Bore

General Details

Site Type	Groundwater	**Sub Type**	Bore or Well	**Site Geofeature**	Ground
Northing	6462059	**Easting**	391201	**Zone**	50
Latitude	-31.972270367	**Longitude**	115.848524076	**Spheroid**	GDA94
Thou250 Map Index	SH5014	**Geographic Precision (+/- m)**	+/-100m		
Local Govt Authority	CITY OF SOUTH PERTH	**Locality**	SOUTH PERTH	**DWER Region**	Swan-Avon
Catchment	SwanAvon_Lower Swan	**Estuary**		**BOM Rainfall District**	9 - Central Coast
River Basin	616 - Swan Coastal	**Groundwater Area**	Perth	**Groundwater Province**	Perth
Surface Water Area	Swan River and Tributaries	**Surface Water SubArea**	Swan/Canning Estuary	**GgStn Catchment Area (km2)**	N/A
Site Comment	Drilled: in progress. Depth originally: 33ft, 32ft. Quality originally: 32.3ft - 3550; 33ft7 = 2600. Rec by: jmw.				

Depth Measurement Points (*Site reference: 61606684)*

Measurement Point Type	Elevation (m as per Datum Plane)	Datum	Measurement Method	Date	Comments
Ground level	0	NA	(none)	01/01/1900	

Drilling - No Data Available

Borehole Information (*Site reference: 61606684)*

Completed Date	1/01/1900	**Drill Method Name**	Unknown		
Owner Name	Private Owner	**Drill Rig Name**	Unknown		
Drill Company Name	Private Owner	**Total Construction Depth (mbGL)**	0	**Depth Drilled (mbGL)**	0
Comments					

Casing (*Site reference: 61606684)*

From (mbGL)	To (mbGL)	Element	Material	Inlet Type	Inside Dia. (mm)	Outside Dia. (mm)	Aperture (mm)	Comments
0.000	0.000	Unknown	Unknown	Not applicable				6in; 6in PVC slotted 5ft

Fill - No Data Available

Aquifers - No Data Available

Lithology Log - No Data Available

Stratigraphy Log - No Data Available

Advanced Data Summary (*Site reference: 61606684 WIN Site ID: 61606684)*

Readings by Project

Default Site Reference	Project Code	Project Name	First Measurement	Last Measurement	No of Measurements
61606684	WA-G-PRE1996AQWADATA	Pre 1996 AQWABase Data Capture	1/01/1900	1/01/1900	2

Readings by Data Category

Default Site Reference	Data Category	First Measurement	Last Measurement	No of Measurements
61606684	Water levels - discrete	1/01/1900	1/01/1900	2

Readings By Variable Type

Default Site Reference	Variable Type	First Measurement	Last Measurement	No of Measurements
61606684	Water Level (discrete)	1/01/1900	1/01/1900	2

Site Details Report

Date: 08/12/2020

Site reference 61606685 - Swan Coastal Catchment 616 - Bore - Bore

Alternative Site References

Numbering System	Reference Code	Site Name	Short Name
AWRC	61606685	Swan Coastal Catchment 616 - Bore	Bore
WIN_ID	20030586		Bore
AQWAB	2034-2-SW-1680	SWAN COASTAL CATCHMENT 616 -	Bore

General Details

Site Type	Groundwater	**Sub Type**	Bore or Well	**Site Geofeature**	Ground
Northing	6462058	**Easting**	391201	**Zone**	50
Latitude	-31.972279387	**Longitude**	115.848523963	**Spheroid**	GDA94
Thou250 Map Index	SH5014	**Geographic Precision (+/- m)**	+/-100m		
Local Govt Authority	CITY OF SOUTH PERTH	**Locality**	SOUTH PERTH	**DWER Region**	Swan-Avon
Catchment	SwanAvon_Lower Swan	**Estuary**		**BOM Rainfall District**	9 - Central Coast
River Basin	616 - Swan Coastal	**Groundwater Area**	Perth	**Groundwater Province**	Perth
Surface Water Area	Swan River and Tributaries	**Surface Water SubArea**	Swan/Canning Estuary	**GgStn Catchment Area (km2)**	N/A
Site Comment	Swl originally: 4-5ft. Tds also recorded as: 3.4 ms/cm. Rec by: sl martin.				

Depth Measurement Points (*Site reference: 61606685)*

Measurement Point Type	Elevation (m as per Datum Plane)	Datum	Measurement Method	Date	Comments
Ground level	0	NA	(none)	07/04/1984	

Drilling - No Data Available

Borehole Information (*Site reference: 61606685)*

Completed Date	7/04/1984	**Drill Method Name**	Unknown		
Owner Name	Private Owner	**Drill Rig Name**	Unknown		
Drill Company Name	Private Owner	**Total Construction Depth (mbGL)**	0	**Depth Drilled (mbGL)**	9.14
Comments					

Casing (*Site reference: 61606685)*

From (mbGL)	To (mbGL)	Element	Material	Inlet Type	Inside Dia. (mm)	Outside Dia. (mm)	Aperture (mm)	Comments
0.000	0.000	Unknown	Unknown	Not applicable				6in; slot/perf/scrn: 5ft.

Fill - No Data Available

Aquifers - No Data Available

Lithology Log - No Data Available

Stratigraphy Log - No Data Available

Advanced Data Summary (*Site reference: 61606685 WIN Site ID: 61606685)*

Readings by Project

Default Site Reference	Project Code	Project Name	First Measurement	Last Measurement	No of Measurements
61606685	WA-G-PRE1996AQWADATA	Pre 1996 AQWABase Data Capture	7/04/1984	7/04/1984	1

Readings by Data Category

Default Site Reference	Data Category	First Measurement	Last Measurement	No of Measurements
61606685	Water quality indicators - discrete	7/04/1984	7/04/1984	1

Readings By Variable Type

Default Site Reference	Variable Type	First Measurement	Last Measurement	No of Measurements
61606685	Physical	7/04/1984	7/04/1984	1

Site Details Report

Date: 08/12/2020

Site reference 61616195 - Swan Coastal Catchment 616 - Bore - Bore

Alternative Site References

Numbering System	Reference Code	Site Name	Short Name
AWRC	61616195	Swan Coastal Catchment 616 - Bore	Bore
WIN_ID	20029928		Bore
AQWAB	2034-2-SW-1022	SWAN COASTAL CATCHMENT 616 -	Bore

General Details

Site Type	Groundwater	**Sub Type**	Unknown	**Site Geofeature**	Ground
Northing	6461660	**Easting**	391240	**Zone**	50
Latitude	-31.975873114	**Longitude**	115.848891835	**Spheroid**	GDA94
Thou250 Map Index	SH5014	**Geographic Precision (+/- m)**	+/-100m		
Local Govt Authority	CITY OF SOUTH PERTH	**Locality**	SOUTH PERTH	**DWER Region**	Swan-Avon
Catchment	SwanAvon_Lower Swan	**Estuary**		**BOM Rainfall District**	9 - Central Coast
River Basin	616 - Swan Coastal	**Groundwater Area**	Perth	**Groundwater Province**	Perth
Surface Water Area	Swan River and Tributaries	**Surface Water SubArea**	Swan/Canning Estuary	**GgStn Catchment Area (km2)**	N/A
Site Comment	Rec by: tehnas.				

Depth Measurement Points (*Site reference: 61616195)*

Measurement Point Type	Elevation (m as per Datum Plane)	Datum	Measurement Method	Date	Comments
Ground level	0	NA	(none)	01/01/1900	

Drilling - No Data Available

Borehole Information (*Site reference: 61616195)*

Completed Date		**Drill Method Name**	Unknown		
Owner Name	Bey Investments Pty Ltd	**Drill Rig Name**	Unknown		
Drill Company Name	Unknown Company	**Total Construction Depth (mbGL)**	0	**Depth Drilled (mbGL)**	0
Comments					

Casing - No Data Available

Fill - No Data Available

Aquifers - No Data Available

Lithology Log - No Data Available

Stratigraphy Log - No Data Available

Advanced Data Summary (*Site reference: 61616195 WIN Site ID: 61616195)*

Readings by Project

Default Site Reference	Project Code	Project Name	First Measurement	Last Measurement	No of Measurements
61616195	WA-G-PRE1996AQWADATA	Pre 1996 AQWABase Data Capture	1/01/1900	1/01/1900	1

Readings by Data Category

Default Site Reference	Data Category	First Measurement	Last Measurement	No of Measurements
61616195	Water quality indicators - discrete	1/01/1900	1/01/1900	1

Readings By Variable Type

Default Site Reference	Variable Type	First Measurement	Last Measurement	No of Measurements
61616195	Physical	1/01/1900	1/01/1900	1

Site Details Report

Date: 08/12/2020

Site reference 61670857 - South Perth - Company - Company

Alternative Site References

Numbering System	Reference Code	Site Name	Short Name
AWRC	61670857	South Perth - Company	Company
WIN_ID	23052662		Company

General Details

Site Type	Groundwater	**Sub Type**	Bore or Well	**Site Geofeature**	Ground
Northing	6461647	**Easting**	391530	**Zone**	50
Latitude	-31.976017949	**Longitude**	115.851959384	**Spheroid**	GDA94
Thou250 Map Index	SH5014	**Geographic Precision (+/- m)**	+/-10m		
Local Govt Authority	CITY OF SOUTH PERTH	**Locality**	SOUTH PERTH	**DWER Region**	Swan-Avon
Catchment	SwanAvon_Lower Swan	**Estuary**		**BOM Rainfall District**	9 - Central Coast
River Basin	616 - Swan Coastal	**Groundwater Area**	Perth	**Groundwater Province**	Perth
Surface Water Area	Swan River and Tributaries	**Surface Water SubArea**	Swan/Canning Estuary	**GgStn Catchment Area(km2)**	N/A
Site Comment	Richardson Park Replacement Bore				

Depth Measurement Points (*Site reference: 61670857)*

Measurement Point Type	Elevation (m as per Datum Plane)	Datum	Measurement Method	Date	Comments
Ground level	0	GL	Unknown	09/05/2008	

Drilling - No Data Available

Site Details Report

Date: *08/12/2020*

Borehole Information (*Site reference: 61670857)*

Completed Date	9/05/2008	**Drill Method Name**	See Comment		
Owner Name	City of South Perth	**Drill Rig Name**	Unknown		
Drill Company Name	RBM Drilling	**Total Construction Depth (mbGL)**	23	**Depth Drilled (mbGL)**	23
Comments	Method: Rotary mud How pump tested: Submersible				

Casing (*Site reference: 61670857)*

From (mbGL)	To (mbGL)	Element	Material	Inlet Type	Inside Dia. (mm)	Outside Dia. (mm)	Aperture (mm)	Comments
0.000	17.000	Casing	PVC - Class 12	Not applicable	203.000			
17.000	23.000	Inlet (screen)	Stainless St 304	Screen	203.000		0.500	

Fill (*Site reference: 61670857)*

From (mbGL)	To (mbGL)	Fill Type	Material Type	Fill Volume (m3)	Grain Size (mm)
0.000	23.000	Annular Fill	Gravel		

Aquifers (*Site reference: 61670857)*

Aquifer Name	Depth From/To (mbGL)	Comments
Reported Aquifer	-	Reported aquifer: Perth-Superficial Swan

Lithology Log *(Site reference: 61670857)*

From (mbGL)	To (mbGL)	Interpreted By	Substance	Lithological Description
0.000	15.000	Driller	Sand	Sand; white; fine
15.000	16.000	Driller	Clay	Clay; orange
16.000	17.000	Driller	Clay	Clay; grey to black
17.000	23.000	Driller	Sand	Sand; cloured; fine to medium

Stratigraphy Log - No Data Available

Advanced Data Summary (*Site reference: 61670857 WIN Site ID: 61670857)*

Readings by Project

Default Site Reference	Project Code	Project Name	First Measurement	Last Measurement	No of Measurements
61670857	SG-G-PRCACSFORM2	PRCACS Form 2 & 2A Data Capture	9/05/2008	9/05/2008	1
61670857	SG-G-PRCACSFORM2	PRCACS Form 2 & 2A Data Capture	9/05/2008	9/05/2008	3

Readings by Data Category

Default Site Reference	Data Category	First Measurement	Last Measurement	No of Measurements
61670857	Water levels - discrete	9/05/2008	9/05/2008	1
61670857	Water quality indicators - discrete	9/05/2008	9/05/2008	3

Readings By Variable Type

Default Site Reference	Variable Type	First Measurement	Last Measurement	No of Measurements
61670857	Physical	9/05/2008	9/05/2008	3
61670857	Water Level (discrete)	9/05/2008	9/05/2008	1

Site Details Report

Date: 08/12/2020

Site reference 61670945 - South Perth - MB1 - MB1

Alternative Site References

Numbering System	Reference Code	Site Name	Short Name
AWRC	61670945	South Perth - MB1	MB1
WIN_ID	23052949		MB1

General Details

Site Type	Groundwater	**Sub Type**	Bore or Well	**Site Geofeature**	Ground
Northing	6462045	**Easting**	391760	**Zone**	50
Latitude	-31.972449966	**Longitude**	115.854437872	**Spheroid**	GDA94
Thou250 Map Index	SH5014	**Geographic Precision (+/- m)**	+/-50m		
Local Govt Authority	CITY OF SOUTH PERTH	**Locality**	SOUTH PERTH	**DWER Region**	Swan-Avon
Catchment	SwanAvon_Lower Swan	**Estuary**	Swan River	**BOM Rainfall District**	9 - Central Coast
River Basin	616 - Swan Coastal	**Groundwater Area**	Perth	**Groundwater Province**	Perth
Surface Water Area	Swan River and Tributaries	**Surface Water SubArea**	Swan/Canning Estuary	**GgStn Catchment Area(km2)**	N/A
Site Comment					

Depth Measurement Points (*Site reference: 61670945)*

Measurement Point Type	Elevation (m as per Datum Plane)	Datum	Measurement Method	Date	Comments
Ground level	0	GL	Unknown	08/10/2009	

Drilling (*Site reference: 61670945)*

From (mbGL)	To (mbGL)	Diameter (mm)	Fluid Name
0.000	7.500		Unknown

Site Details Report

Date: *08/12/2020*

Borehole Information (*Site reference: 61670945)*

Completed Date	8/10/2009	**Drill Method Name**	See Comment		
Owner Name	Private Owner	**Drill Rig Name**	Unknown		
Drill Company Name	Direct Push Probing	**Total Construction Depth (mbGL)**	7.5	**Depth Drilled (mbGL)**	7.5
Comments	Method: Auger				

Casing (*Site reference: 61670945)*

From (mbGL)	To (mbGL)	Element	Material	Inlet Type	Inside Dia. (mm)	Outside Dia. (mm)	Aperture (mm)	Comments
0.000	1.500	Casing	PVC	Not applicable	44.000	50		
1.500	7.500	Inlet (screen)	Unknown	Slotted		50	0.500	

Fill (*Site reference: 61670945)*

From (mbGL)	To (mbGL)	Fill Type	Material Type	Fill Volume (m3)	Grain Size (mm)
1.500	7.500	Annular Fill	Gravel		
0.300	1.200	Annular Fill	Unknown		
1.200	1.500	Seal	Bentonite		

Aquifers (*Site reference: 61670945)*

Aquifer Name	Depth From/To (mbGL)	Comments
Reported Aquifer	-	Reported aquifer: Perth-Superficial Swan

Lithology Log *(Site reference: 61670945)*

From (mbGL)	To (mbGL)	Interpreted By	Substance	Lithological Description
0.000	0.800	Driller	Sand	Sand; fine; light brown; well sorted; subround; subspherical; loose
0.800	1.200	Driller	Sand	Sand; medium; greyish brown; well sorted; subround; subspherical; loose
1.200	1.600	Driller	Clay	Clay; sandy; very dark grey; organic; with sulphur odour
1.600	2.400	Driller	Sand	Sand; medium; grey; well sorted; subround to round; subspherical; loose
2.400	2.800	Driller	Sand	Sand; fine to medium; brownish pale yellow; subround; subspherical; low dense
2.800	3.400	Driller	Sand	Sand; fine with clay; light grey; well sorted; round; spheric; low dense
3.400	5.500	Driller	Sand	Sand; fine to medium; brownish pale yellow; subround; subspherical; dense
5.500	6.000	Driller	Sand	Sand; clayey; medium; brownish yellow to light red; dense; medium plasticity
6.000	7.500	Driller	Unknown	Not sampled past 6m

Stratigraphy Log - No Data Available

Advanced Data Summary (*Site reference: 61670945 WIN Site ID: 61670945)*

Readings by Project

Default Site Reference	Project Code	Project Name	First Measurement	Last Measurement	No of Measurements
61670945	SG-G-PRCACSFORM2	PRCACS Form 2 & 2A Data Capture	8/10/2009	8/10/2009	1
61670945	SG-G-PRCACSFORM2	PRCACS Form 2 & 2A Data Capture	8/10/2009	8/10/2009	3

Readings by Data Category

Default Site Reference	Data Category	First Measurement	Last Measurement	No of Measurements
61670945	Water levels - discrete	8/10/2009	8/10/2009	1
61670945	Water quality indicators - discrete	8/10/2009	8/10/2009	3

Readings By Variable Type

Default Site Reference	Variable Type	First Measurement	Last Measurement	No of Measurements
61670945	Physical	8/10/2009	8/10/2009	3
61670945	Water Level (discrete)	8/10/2009	8/10/2009	1

Site Details Report

Date: 08/12/2020

Site reference 61670946 - South Perth - Private Mb2 - Private Mb2

Alternative Site References

Numbering System	Reference Code	Site Name	Short Name
AWRC	61670946	South Perth - Private Mb2	Private Mb2
WIN_ID	23052950		Private Mb2

General Details

Site Type	Groundwater	**Sub Type**	Bore or Well	**Site Geofeature**	Ground
Northing	6462064	**Easting**	391773	**Zone**	50
Latitude	-31.972279826	**Longitude**	115.854577563	**Spheroid**	GDA94
Thou250 Map Index	SH5014	**Geographic Precision (+/- m)**	+/-50m		
Local Govt Authority	CITY OF SOUTH PERTH	**Locality**	SOUTH PERTH	**DWER Region**	Swan-Avon
Catchment	SwanAvon_Lower Swan	**Estuary**	Swan River	**BOM Rainfall District**	9 - Central Coast
River Basin	616 - Swan Coastal	**Groundwater Area**	Perth	**Groundwater Province**	Perth
Surface Water Area	Swan River and Tributaries	**Surface Water SubArea**	Swan/Canning Estuary	**GgStn Catchment Area(km2)**	N/A
Site Comment					

Depth Measurement Points (*Site reference: 61670946)*

Measurement Point Type	Elevation (m as per Datum Plane)	Datum	Measurement Method	Date	Comments
Ground level	0	GL	Unknown	08/10/2009	

Drilling (*Site reference: 61670946)*

From (mbGL)	To (mbGL)	Diameter (mm)	Fluid Name
0.000	7.500		Unknown

Site Details Report

Date: *08/12/2020*

Borehole Information (*Site reference: 61670946)*

Completed Date	8/10/2009	**Drill Method Name**	See Comment		
Owner Name	Private Owner	**Drill Rig Name**	Unknown		
Drill Company Name	Direct Push Probing	**Total Construction Depth (mbGL)**	7.5	**Depth Drilled (mbGL)**	7.5
Comments	Method: Auger				

Casing (*Site reference: 61670946)*

From (mbGL)	To (mbGL)	Element	Material	Inlet Type	Inside Dia. (mm)	Outside Dia. (mm)	Aperture (mm)	Comments
0.000	1.500	Casing	PVC	Not applicable	44.000	50		
1.500	7.500	Inlet (screen)	PVC	Slotted			0.500	

Fill (*Site reference: 61670946)*

From (mbGL)	To (mbGL)	Fill Type	Material Type	Fill Volume (m3)	Grain Size (mm)
1.500	7.500	Annular Fill	Gravel		
0.300	1.200	Annular Fill	Unknown		
1.200	1.500	Seal	Bentonite		

Aquifers (*Site reference: 61670946)*

Aquifer Name	Depth From/To (mbGL)	Comments
Reported Aquifer	-	Reported aquifer: Perth-Superficial Swan

Lithology Log *(Site reference: 61670946)*

From (mbGL)	To (mbGL)	Interpreted By	Substance	Lithological Description
0.000	1.200	Driller	Sand	Sand; fine; light brown; well sorted; subround; subspherical; loose
1.200	1.500	Driller	Clay	Clay; sandy; very dark grey; organic; with sulphur odour
1.500	2.000	Driller	Sand	Sand; clayey medium; grey; dense; well sorted; subangular to subround
2.000	2.500	Driller	Sand	Sand; medium; grey; well sorted; subround to round; subspherical; loose
2.500	4.200	Driller	Sand	Sand; fine to medium; white; well sorted; subround; spheric; low dense
4.200	6.000	Driller	Sand	Sand; fine to medium; brownish pale yellow; well sorted; low dense; subround; medium sphericity; gets dense and clayey about 5.8m
6.000	7.500	Driller	Unknown	No sampling beyond 6m

Stratigraphy Log - No Data Available

Advanced Data Summary - No Data Available

Site Details Report

Date: 08/12/2020

Site reference 61670947 - South Perth - Private Mb3 - Private Mb3

Alternative Site References

Numbering System	Reference Code	Site Name	Short Name
AWRC	61670947	South Perth - Private Mb3	Private Mb3
WIN_ID	23052951		Private Mb3

General Details

Site Type	Groundwater	**Sub Type**	Bore or Well	**Site Geofeature**	Ground
Northing	6462035	**Easting**	391778	**Zone**	50
Latitude	-31.972541885	**Longitude**	115.854627222	**Spheroid**	GDA94
Thou250 Map Index	SH5014	**Geographic Precision (+/- m)**	+/-50m		
Local Govt Authority	CITY OF SOUTH PERTH	**Locality**	SOUTH PERTH	**DWER Region**	Swan-Avon
Catchment	SwanAvon_Lower Swan	**Estuary**	Swan River	**BOM Rainfall District**	9 - Central Coast
River Basin	616 - Swan Coastal	**Groundwater Area**	Perth	**Groundwater Province**	Perth
Surface Water Area	Swan River and Tributaries	**Surface Water SubArea**	Swan/Canning Estuary	**GgStn Catchment Area(km2)**	N/A
Site Comment					

Depth Measurement Points (*Site reference: 61670947)*

Measurement Point Type	Elevation (m as per Datum Plane)	Datum	Measurement Method	Date	Comments
Ground level	0	GL	Unknown	08/10/2009	

Drilling (*Site reference: 61670947)*

From (mbGL)	To (mbGL)	Diameter (mm)	Fluid Name
0.000	7.500		Unknown

Site Details Report

Date: *08/12/2020*

Borehole Information (*Site reference: 61670947)*

Completed Date	8/10/2009	**Drill Method Name**	See Comment		
Owner Name	Private Owner	**Drill Rig Name**	Unknown		
Drill Company Name	Direct Push Probing	**Total Construction Depth (mbGL)**	7.5	**Depth Drilled (mbGL)**	7.5
Comments	Method: Auger				

Casing (*Site reference: 61670947)*

From (mbGL)	To (mbGL)	Element	Material	Inlet Type	Inside Dia. (mm)	Outside Dia. (mm)	Aperture (mm)	Comments
0.000	1.500	Casing	PVC	Not applicable	44.000	50		
1.500	7.500	Inlet (screen)	PVC	Slotted		50	0.500	

Fill (*Site reference: 61670947)*

From (mbGL)	To (mbGL)	Fill Type	Material Type	Fill Volume (m3)	Grain Size (mm)
1.500	7.500	Annular Fill	Gravel		
0.300	1.200	Annular Fill	Unknown		
1.200	1.500	Seal	Bentonite		

Aquifers (*Site reference: 61670947)*

Aquifer Name	Depth From/To (mbGL)	Comments
Reported Aquifer	-	Reported aquifer: Perth-Superficial Swan

Lithology Log *(Site reference: 61670947)*

From (mbGL)	To (mbGL)	Interpreted By	Substance	Lithological Description
0.000	0.400	Driller	Sand	Sand; fine; light brown; well sorted; subround; subspherical; loose
0.400	1.200	Driller	Sand	Sand; medium; light grey; well sorted; round; spheric; loose
1.200	1.400	Driller	Clay	Clay; sandy; very dark grey; organic; with sulphur odour
1.400	1.600	Driller	Sand	Sand; clayey medium; brown; well sorted; round; spheric; loose
1.600	2.500	Driller	Sand	Sand; medium; grey; well sorted; subround to round; subspherical; loose
2.500	4.600	Driller	Sand	Sand; fine to medium; white; well sorted; subround; spheric; low dense
4.600	6.000	Driller	Sand	Sand; fine to medium; brownish pale yellow; subround; subspheric; dense
6.000	7.500	Driller	Unknown	No sampling past 6m

Stratigraphy Log - No Data Available

Advanced Data Summary - No Data Available

Appendix C
Soil Bore and Well Construction Logs

BOREHOLE LOG - BH01

Client: NS Projects
Project: 88 Mill Point Road
Location: 88 Mill Point Road
Project ID: PER2020-0345
Date:

CMW Geosciences

1:50 Sheet 1 of 3

Logged by: KC
Checked by:

Position: E.391381m N.6462127m
Elevation: 1.7 m

Plant: Geoprobe 7822
Contractor: National Geotech

Drilling Method	Well	Groundwater	Coring TCR	Coring SCR	Coring RQD	RL (m)	Depth (m)	Graphic Log	Rock/Soil Description	Consistency	Moisture Condition	Rock Strength (VL L M H VH EH; 6 60; UCS (MPa); UCS (from Is50))	Cementation/ Weathering	Defect Spacing (mm) (<20; 20-40; 40-100; 100-300; 300-1000; >1000)	Samples, test results and additional Data
HA			100			1.7 1.6 1.5			SM: Silty SAND: pale brown, dry to moist, poorly graded, fine to medium grained, subrounded to subangular; with rootlets; trave gravel, fine (Fill)		D to M				
									SM: Silty SAND: red brown, dry to moist, poorly graded, fine to medium grained, subrounded to subangular; trave gravel, fine (Fill)						
							1		SP: SAND: brown, dry to moist, poorly graded, fine to coarse grained, subrounded to subangular; trace silt; trave demolition debris (Fill)						
SPT			100			0.2			SP: SAND: brown, dry to moist, poorly graded, medium to coarse grained, subrounded to subangular; trace gravel, fine to medium, subrounded (Fill)						1.5m:SPT: (3,4,4) N=8
DPP			100				2								
						-1.2									
SPT			100				3		SP: SAND: SAND, grey, wet, fine to coarse, subangular to subrounded (Alluvium)						3.0m:SPT: (3,7,9) N=16
DPP			100				4								
SPT			100												4.5m:SPT: (3,9,12) N=21
DPP			100				5								
SPT			100				6								6.0m:SPT: (4,8,11) N=19
DPP			100				7								
SPT			100												7.5m:SPT: (3,4,9) N=13
DPP			100				8								
HQ3			100			-7.3	9		SP: CORELOSS: wash out. Assume SAND as above/below (Alluvium)						
						-7.7			SP: SAND: SAND, grey, wet, fine to coarse, subangular to subrounded (Alluvium)						
SPT			20												9.5m:SPT: (5,9,12) N=21
						-8.3	10		SP: CORELOSS: wash out. Assume SAND as above, possibly with clay as below (Alluvium)						

Termination reason: Traget Depth Reached
Remarks:

BOREHOLE LOG - BH01

Client: NS Projects
Project: 88 Mill Point Road
Location: 88 Mill Point Road
Project ID: PER2020-0345
Date:

CMW Geosciences

1:50 Sheet 2 of 3

Logged by: KC
Checked by:

Position: E.391381m N.6462127m
Elevation: 1.7 m

Plant: Geoprobe 7822
Contractor: National Geotech

Drilling Method	Well	Groundwater	Coring TCR	Coring SCR	Coring RQD	RL (m)	Depth (m)	Graphic Log	Rock/Soil Description	Consistency	Moisture Condition	Rock Strength (VL L M H VH EH; UCS (MPa) 6 60; UCS (from Is50))	Cementation/ Weathering	Defect Spacing (mm) <20 20-40 40-100 100-300 300-1000 >1000	Samples, test results and additional Data
HQ3			10						SP: CORELOSS: wash out. Assume SAND as above, possibly with clay as below (Alluvium)						
SPT			100			-9.3	11		SP: SAND: grey brown, wet, poorly graded, fine to medium, non plastic to low plasticity; with clay						11.0m:SPT: (3,1,1) N=2
HQ3			100				12		*... from 11.90m to 12.50m, becomes grey mottled orange*						
SPT			100			-10.8			SC: Clayey SAND: grey mottled , wet, poorly graded, low plasticity, poorly graded; sand is fine to medium (Alluvium)						12.5m:SPT: (1,0,1) N=1
HQ3			100			-11.3	13		ML: Clayey SILT: red brown, wet, low plasticity; trace sand, fine to medium (Alluvium)						
						-11.9			CH: CLAY: greyish brown, wet, high plasticity; with silt; trace sand, finer to medium (Alluvium)						
SPT			100			-12.4	14		CH: CLAY: brown grey, wet, stiff, high plasticity (Alluvium)						14.0m:SPT: (6,9,9) N=18
HQ3			100			-12.8			CH: CLAY: brown grey, wet, stiff, high plasticity; trace sand, fine to medium (Alluvium)		W				
							15								
SPT			100			-13.8			ML: SILT: brown grey, wet, medium plasticity; with clay (Alluvium)						15.5m:SPT: (2,3,3) N=6
HQ3			80			-14.4	16		SC: Clayey SAND: grey brown, wet, non plastic, fine to medium (Alluvium)						
						-14.7			SC: CORELOSS: wash out. Assume Clayey SAND as above/below (Alluvium)						
						-14.9			SC: Clayey SAND: grey brown, wet, non plastic, fine to medium (Alluvium)						
SPT			100			-15.3	17		SP: SAND: grey brown, wet, poorly graded, non plastic, fine grained; trace silt (Alluvium)						17.0m:SPT: (1,3,3) N=6
HQ3			50			-15.8			SP: CORELOSS: wash out. Assume SAND trace silt as above/below (Alluvium)						
						-16.3	18		SP: SAND: grey brown, wet, poorly graded, non plastic, fine grained; trace silt (Alluvium)						
						-16.7			SC: Clayey SAND: grey brown, wet, low plasticity; sand is fine (Alluvium)						18.5m:SPT: (1,6,6) N=12
SPT			100			-17.0			SP: SAND: grey brown, wet, poorly graded, non plastic; trace silt (Alluvium)						
HQ3			100			-17.5	19		SP: Gravely SAND: brown, wet, poorly graded, medium to coarse grained, subangular; gravel is fine, subangular to subrounded (Alluvium)						
						-17.9			SM: Silty SAND: brown, wet, fine to coarse grained, subangular to subrounded, low plasticity; trace gravel, fine, subangular (Alluvium)						
							20								20.0m:SPT: (4,7,10) N=17
						-18.5									

Termination reason: Traget Depth Reached
Remarks:

BOREHOLE LOG - BH01

Client: NS Projects
Project: 88 Mill Point Road
Location: 88 Mill Point Road
Project ID: PER2020-0345
Date:

CMW Geosciences

1:50 Sheet 3 of 3

Logged by: KC
Checked by:

Position: E.391381m N.6462127m
Elevation: 1.7 m

Plant: Geoprobe 7822
Contractor: National Geotech

Drilling Method	Well	Groundwater	Coring TCR	Coring SCR	Coring RQD	RL (m)	Depth (m)	Graphic Log	Rock/Soil Description	Consistency	Moisture Condition	Rock Strength (VL L M H VH EH; 6 60; UCS (MPa); UCS (from Is50))	Cementation/ Weathering	Defect Spacing (mm) (<20; 20-40; 40-100; 100-300; 300-1000; >1000)	Samples, test results and additional Data
SPT			100						SW: SAND: brown, wet, well graded, fine to coarse, subangular to subrounded; trace silt; trace gravel, fine, rounded (Alluvium)						
						-18.8			SW: CORELOSS: wash out. Assume SAND above and below (Alluvium)						
HQ3			50			-19.3	21		SW: SAND: brown, wet, well graded, fine to coarse, subangular to subrounded; trace silt; trace gravel, fine, rounded (Alluvium)						
						-19.5			SW: Silty SAND: brown, wet, well graded, fine to coarse, subangular to subrounded, non plastic; with clay; trace gravel, fine rounded (Alluvium)						
SPT			100			-19.8			SW: SAND: pale brown, wet, well graded, fine to coarse grained, angular to subrounded; trace gravel, fine to medium, subrounded to subangular (Alluvium)						21.5m:SPT: (8,19,16) N=35
						-20.3	22		SW: CORELOSS: wash out. Assume SAND trace gravel as above and below (Alluvium)						
HQ3			50			-20.8			SW: SAND: pale brown, wet, well graded, fine to coarse grained, angular to subrounded; trace gravel, fine to medium, subrounded to subangular; trace silt (Alluvium)						
SPT			100				23								23.0m:SPT: (4,10,16) N=26
HQ3			75				24								
						-22.6			SW: CORELOSS: wash out. Assume Gravel and SAND mix as above and below (Alluvium)						
SPT			100			-22.8			GM: Silty GRAVEL: pale brown, wet, fine, subangular to subrounded, poorly graded; trace sand, fine to coarse (Alluvium)						24.5m:SPT: (7,8,9) N=17
						-23.3	25		GM: CORELOSS: wash out. Outside return material is the same as above (Alluvium)						
HQ3			0												
						-24.3	26		ML: Gravely SILT: pale brown yellow, wet, non plastic; gravel is fine occasionally medium grained, sub angular to angular (Alluvium)						26.0m:SPT: (23,50,) N=R
SPT			100			-24.8			ML: CORELOSS: wash out. Assume gravely silt as above and below (Alluvium)						
HQ3			20				27								
						-25.6			ML: Gravely SILT: pale brown yellow, wet, non plastic; gravel is fine occasionally medium grained, sub angular to angular (Alluvium)						
SPT			100			-25.8			SW: SAND: grey brown, wet, well graded, fine to coarse, sub angular to subrounded; trace silt; trace gravel, fine, subrounded (Alluvium)						27.5m:SPT: (40,50/0.11mm) N=R
							28								
HQ3			30			-26.6			SW: CORELOSS: was wash out. Assume SANE trave grave, trave silt, as above and below (Alluvium)						
						-27.3	29		SW: SAND: grey brown, wet, well graded, fine to coarse, sub angular to subrounded; trace silt; trace gravel, fine, subrounded (Alluvium)						29.0m:SPT: (21,40/0.9mm) N=R
SPT			100												
									Borehole terminated at 29.4 m						
							30								

Termination reason: Traget Depth Reached
Remarks:

BOREHOLE LOG - BH02

Client: NS Projects
Project: 88 Mill Point Road
Location: 88 Mill Point Road
Project ID: PER2020-0345
Date:

CMW Geosciences

1:50 Sheet 1 of 3

Logged by: KC
Checked by:

Position: E.391387m N.6462079m
Elevation: 2.1 m

Plant: Geoprobe 7822
Contractor: National Geotech

Drilling Method	Well	Groundwater	Coring TCR	Coring SCR	Coring RQD	RL (m)	Depth (m)	Graphic Log	Rock/Soil Description	Consistency	Moisture Condition	Rock Strength (VL L M H VH EH; UCS (MPa) 6 60; UCS (from Is50))	Cementation/ Weathering	Defect Spacing (mm) <20 20-40 40-100 100-300 300-1000 >1000	Samples, test results and additional Data
						2.1			SM: Silty SAND: brown, dry to moist, well graded, fine to medium, angular to subangular; trace gravel, fine, subrounded; trace rootlets (Fill)						
HA			100			1.6			SP: SAND: grey, moist, poorly graded, fine to medium occasionally coarse grained; trace silt (Alluvium)						
						1.1	1		SP: SAND: grey, moist, poorly graded, fine to medium occasionally coarse grained (Alluvium)						
SPT			100			0.6			PW: SAND: grey, moist, poorly graded, fine to medium (Alluvium)		D to M				1.5m:SPT: (1,3,4) N=7
DPP			100				2								
SPT			100			-0.9	3		SW: SAND: grey brown, wet, well graded, fine to coarse grained (Alluvium)						3.0m:SPT: (3,4,6) N=10
DPP			100				4								
SPT			100												4.5m:SPT: (2,4,7) N=11
DPP			100				5				W				
SPT			100				6								6.0m:SPT: (4,6,9) N=15
DPP			100				7								
SPT			100			-5.2			SP: SAND: yellow grey, wet, non plastic, poorly graded; with clay (Alluvium)						7.5m:SPT: (5,9,11) N=20
DPP			100			-6.3	8		CH: CLAY: grey mottled orange, moist, high plasticity, very stiff (Alluvium)		M				
SPT			100			-6.9	9		CH: CLAY: grey, wet, high plasticity, very stiff; trace sand, fine to medium (Alluvium)		W				9.0m:SPT: (2,4,7) N=11
DPP			100			-7.4			CH: CLAY: dark grey, moist, high plasticity, very stiff; trace sand, fine grained (Alluvium)						
							10								

Termination reason: Traget Depth Reached
Remarks:

BOREHOLE LOG - BH02

Client: NS Projects
Project: 88 Mill Point Road
Location: 88 Mill Point Road
Project ID: PER2020-0345
Date:

CMW Geosciences

1:50 Sheet 2 of 3

Logged by: KC
Checked by:

Position: E.391387m N.6462079m
Elevation: 2.1 m

Plant: Geoprobe 7822
Contractor: National Geotech

Drilling Method	Well	Groundwater	Coring TCR	Coring SCR	Coring RQD	RL (m)	Depth (m)	Graphic Log	Rock/Soil Description	Consistency	Moisture Condition	Rock Strength (VL L M H VH EH; UCS (MPa) 6 60; UCS (from Is50))	Cementation/ Weathering	Defect Spacing (mm) <20 20-40 40-100 100-300 300-1000 >1000	Samples, test results and additional Data
						-8.2			CH: CLAY: dark grey, moist, high plasticity, very stiff; trace sand, fine grained (Alluvium)						
SPT			100			-8.8			SC: Clayey SAND: orange brown, wet, high plasticity, poorly graded, fine grained (Alluvium)						10.5m:SPT: (2,3,4) N=7
DPP			100				11		CH: CLAY: dark grey mottled orange, moist, high plasticity, very stiff (Alluvium)		M				
						-9.7									
SPT			100				12		SP: SAND: orange, wet, low plasticity, poorly graded, non plastic, fine grained; with clay; trace silt (Alluvium)		W				12.0m:SPT: (7,4,3) N=7
DPP			100			-10.5			CH: CLAY: grey brown, moist, high plasticity; with sand, fine to medium grained (Alluvium)		M				
							13		*... from 13.00m to 13.10m, trace grave, feric concertions* *... from 13.20m to 13.40m, mottled orange, wet*						
SPT			100								W				13.5m:SPT: (1,3,5) N=8
						-11.8	14		CH: CLAY: dark grey, wet, high plasticity (Alluvium)						
DPP			100			-12.3			GM: Sandy CLAY: orange brown, moist to wet, high plasticity; sand is fine grained (Alluvium)		M				
SPT			100			-12.9	15		GM: Sandy CLAY: orange brown, wet, high plasticity; sand is fine grained (Alluvium)						15.0m:SPT: (2,3,6) N=9
						-13.4			CH: CORELOSS: Assume to be sand clay mix as above and below (Alluvium)						
						-13.6			CH: CLAY: brown, wet, high plasticity; with sand, fine grained (Alluvium)						
HQ3			100				16								
						-14.9	17		CM: Sandy CLAY: brown, wet, medium plasticity; sand is fine grained (Alluvium)						17.0m:SPT: (4,5,7) N=12
SPT			100												
HQ3			100			-15.8	18		SC: Clayey SAND: pale brown, wet, poorly graded, non plastic, fine to coarse grained (Alluvium)						
						-16.3			SP: SAND: pale brown, wet, poorly graded, fine to medium occasionally coarse grained, subrounded, non plastic; trace silt (Alluvium)						18.5m:SPT: (5,7,11) N=18
SPT			100												
						-16.9	19		SP: CORELOSS: wash out. Assumed SAND as above and below (Alluvium)						
HQ3			50			-17.4			SP: SAND: pale brown, wet, poorly graded, fine to medium occasionally coarse grained, subrounded, non plastic; trace silt; trace gravel, fine to medium, subrounded (Alluvium)						
							20								20.0m:SPT: (7,7,11) N=18

Termination reason: Traget Depth Reached
Remarks:

BOREHOLE LOG - BH02

Client: NS Projects
Project: 88 Mill Point Road
Location: 88 Mill Point Road
Project ID: PER2020-0345
Date:

CMW Geosciences

1:50 Sheet 3 of 3

Logged by: KC
Checked by:

Position: E.391387m N.6462079m
Elevation: 2.1 m

Plant: Geoprobe 7822
Contractor: National Geotech

Drilling Method	Well	Groundwater	Coring TCR	Coring SCR	Coring RQD	RL (m)	Depth (m)	Graphic Log	Rock/Soil Description	Consistency	Moisture Condition	Rock Strength (VL L M H VH EH; UCS (MPa) 6 60; UCS (from Is50))	Cementation/ Weathering	Defect Spacing (mm) <20 20-40 40-100 100-300 300-1000 >1000	Samples, test results and additional Data
SPT			100			-18.4			SP: SAND: pale brown, wet, poorly graded, fine to medium occasionally coarse grained, subrounded, non plastic; trace silt; trace gravel, fine to medium, subrounded (Alluvium)						
HQ3			50			-18.9	21		SP: CORELOSS: wash out. Assumed SAND as above and below (Alluvium)						
						-19.4			SP: SAND: red brown, wet, poorly graded, non plastic, fine to coarse; with silt; with clay; trace gravel, fine to medium, surrounded (Alluvium)						
SPT			100						SP: Gravely SAND: pale brown, wet, poorly graded, non plastic; gravel is fine to medium, sub angular to sub rounded; with silt; with clay (Alluvium)						21.5m:SPT: (2,5,7) N=12
HQ3			100			-19.9	22		GP: GRAVEL: yellow brown, wet, poorly graded, medium grained, subrounded; trace silt (Alluvium)						
						-20.4			SP: Gravely SAND: red brown, wet, poorly graded, fine to to coarse, subrounded to subangular, low plasticity; gravel is fine to medium, subrounded; with silt (Alluvium)						
SPT			100			-20.9	23		GM: Silty Gravel: yellow brown, wet, poorly graded, fine grained, subrounded to subangular (Alluvium)						23.0m:SPT: (7,16,16) N=32
HQ3			100				24								
						-22.3			GM: Sandy GRAVEL: yellow brown, wet, fine, subangular to subrounded; sand is coarse, subangular to subrounded; with silt (Alluvium)						
SPT			100			-22.8	25		GM: CORELOSS: wash out. Material in outside return is sandy GRAVEL as above (Alluvium)		W				24.5m:SPT: (7,16,18) N=34
HQ3			0												
SPT			100			-23.9	26		SP: SAND: yellow brown, wet, poorly graded, fine to medium occasionally coarse, subangular to subrounded, non plastic; trace silt (Alluvium)						26.0m:SPT: (50,,) N=R
HQ3			100				27								
SPT			100												27.5m:SPT: (26,42,50/1.2mm) N=R
							28		*... from 28.00m to 29.45m, yellow brown mottled dark grey*						
HQ3			100												
SPT			100				29								29.0m:SPT: (19,50,/1.4mm) N=R
									Borehole terminated at 29.4 m						
							30								

Termination reason: Traget Depth Reached
Remarks:

BOREHOLE LOG - BH03

Client: NS Projects
Project: 88 Mill Point Road
Location: 88 Mill Point Road
Project ID: PER2020-0345
Date:

CMW Geosciences

1:50 Sheet 1 of 1

Logged by: KC
Checked by:

Position: E.391427m N.6462114m
Elevation: 2.2 m

Plant: Geoprobe 7822
Contractor: National Geotech

Drilling Method	Well	Groundwater	Coring TCR	Coring SCR	Coring RQD	RL (m)	Depth (m)	Graphic Log	Rock/Soil Description	Consistency	Moisture Condition	Rock Strength (VL L M H VH EH; UCS (MPa) 6 60; UCS (from Is50))	Cementation/ Weathering	Defect Spacing (mm) <20 20-40 40-100 100-300 300-1000 >1000	Samples, test results and additional Data
HA			100			2.2			Gravely SAND: dark brown, dry, poorly graded, fine to medium; gravel is fine, subrounded (Fill)						
						1.9			SP: SAND: yellow brown, dry, poorly graded, fine to medium, subrounded to subangular, non plastic; trace silt (Alluvium)		D				
							1								
						1.0			SP: SAND: yellow brown, moist, poorly graded, fine to medium, subrounded to subangular, non plastic; trace silt (Alluvium)		M				
						0.4			SP: SAND: yellow brown, wet, poorly graded, fine to medium, subrounded to subangular (Alluvium)						
							2								
						-0.8	3		SP: SAND: grey, wet, poorly graded, fine to medium, subrounded to subangular (Alluvium)						
							4								
DPP			100				5				W				
							6								
							7								
						-5.2			SP: SAND: grey mottled dark grey, wet, poorly graded, fine to medium, subrounded to subangular (Alluvium)						
							8		Borehole terminated at 8.0 m						
							9								
							10								

Termination reason: Traget Depth Reached
Remarks:

BOREHOLE LOG - BH04

Client: NS Projects
Project: 88 Mill Point Road
Location: 88 Mill Point Road
Project ID: PER2020-0345
Date:

CMW Geosciences

1:50 Sheet 1 of 1

Logged by: KC
Checked by:

Position: E.391360m N.6462137m
Elevation: 1.5 m

Plant: Geoprobe 7822
Contractor: National Geotech

Drilling Method	Well	Groundwater	Coring: TCR	Coring: SCR	Coring: RQD	RL (m)	Depth (m)	Graphic Log	Rock/Soil Description	Consistency	Moisture Condition	Rock Strength (VL L M H VH EH; UCS (MPa); UCS (from Is50))	Cementation/ Weathering	Defect Spacing (mm)	Samples, test results and additional Data
HA			100			1.5			SAND: dark brown, dry, fine to medium, poorly graded, subangular to subrounded; trace silt; trace gravel fine, subrounded; trace brick fragments; trace rootlets (Fill)		D				
						1.2			SAND: yellow brown, dry, fine to medium, poorly graded, subangular to subrounded; trace silt; trace gravel fine, subrounded; trace brick fragments; trace rootlets (Fill)						
						0.9	1		SP: SAND: grey, moist, poorly graded, fine to medium, subangular to subrounded; trace roots, >2mm diameter (Alluvium)		M				
						0.3			SP: SAND: grey mottled orange, moist, poorly graded, fine to medium, subangular to subrounded (Alluvium)						
						-0.1	2		SP: SAND: brown, moist, poorly graded, fine to medium, subangular to subrounded (Alluvium)						
						-1.5	3		SP: SAND: pale brown, moist, poorly graded, fine to medium, subangular to subrounded (Alluvium)						
						-2.6	4		SP: SAND: grey, moist, poorly graded, fine to medium, subangular to subrounded (Alluvium)						
DPP			100				5				W				
							6								
							7								
							8		Borehole terminated at 8.0 m						
							9								
							10								

Termination reason: Traget Depth Reached
Remarks:

Appendix D
Laboratory Documentation

CHAIN OF CUSTODY RECORD

WESTERN ENVIRONMENTAL

Company Name : WESTERN ENVIRONMENTAL PTY LTD	Contact Name : Ruth Allen	Purchase Order : 20.227	CoC Number : 1942
Office Address : Level 3, 25 Prowse Street, West Perth, WA 6005	Project Manager : Ruth Allen	Project Number : 20.227	Quote ID : 190301W
Laboratory Address : mgt-Eurofins Unit 2, 91 Leach Hwy Kewdale WA 6105 Contact: Rob Johnston, +61 (0)8 9251 9605, +61 (0)4 2357 9286 Email: Robertjohnston@eurofins.com	Email for results: ruth.a@westenv.com.au	CC 1 & 2: james.g@westenv.com.au	Courier Consignment # :

Special Directions & Comments :

#	Sample ID	Sample Date	Matrix	Analytes: pH Field & Fox	SPOCAS	Suite B9: TRH, BTEXN, PAH, OCP, Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg)	HOLD	Container: 1L-Green	250ml Green	Black MB plastic	100ml Red Plastic	100ml Purple Plastic	VIAL	Glass Jar	ASS Soil Bag
1	BH01 0.25	25/11/2020	SOIL	X											1
2	BH01 0.5	25/11/2020	SOIL	X		X								1	1
3	BH01 0.75	25/11/2020	SOIL	X											1
4	BH01 1.0	25/11/2020	SOIL	X										1	1
5	BH01 1.25	25/11/2020	SOIL	X											1
6	BH01 1.5	25/11/2020	SOIL	X										1	1
7	BH01 1.75	25/11/2020	SOIL	X											1
8	BH01 2.0	25/11/2020	SOIL	X										1	1
9	BH01 2.25	25/11/2020	SOIL	X											1
10	BH01 2.5	25/11/2020	SOIL	X											1
11	BH01 2.75	25/11/2020	SOIL	X											1
12	BH01 3.0	25/11/2020	SOIL	X											1
13	BH01 3.25	25/11/2020	SOIL	X											1
14	BH01 3.5	25/11/2020	SOIL	X											1
15	BH01 3.75	25/11/2020	SOIL	X											1

Date/Time: 1/12/20 10:23 am
Chilled: Yes / No
Temp: 19.7, 19.3, 19.3, -0.3
Correction:
Final Temp: 19.2°C

Relinquished By: _____
Date & Time : _____
Signature: _____

Received By: Monique Jackson
Date & Time : 1/12/20 10:23 am
Signature: [signature]
Report Number : 761067

Turn around Time : 5 Days

Comments : Please provide preliminary report for pH Field & Fox results.

Method Of Shipment :
Courier
Hand Delivered
Postal

CHAIN OF CUSTODY RECORD

Company Name : WESTERN ENVIRONMENTAL PTY LTD	Contact Name : Ruth Allen	Purchase Order : 20.227	CoC Number : 1942
Office Address : Level 3, 25 Prowse Street, West Perth, WA 6005	Project Manager : Ruth Allen	Project Number : 20.227	Quote ID : 190301W
Laboratory Address : mgt-Eurofins Unit 2, 91 Leach Hwy Kewdale WA 6105 Contact: Rob Johnston, +61 (0)8 9251 9605, +61 (0)4 2357 9286 Email: Robertjohnston@eurofins.com	Email for results: ruth.a@westenv.com.au	CC: james.g@westenv.com.au 0	Courier Consignment # :

#	Sample ID	Sample Date	Matrix	Analytes: pH Field & Fox	SPOCAS	Suite B9: TRH, BTEXN, PAH, OCP, Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg)	HOLD	Container: 1L-Green	250ml Green	Black MB plastic	100ml Red Plastic	100ml Purple Plastic	VIAL	Glass Jar	ASS Soil Bag
16	BH01 4.0	25/11/2020	SOIL	X											1
17	BH01 4.25	25/11/2020	SOIL	X											1
18	BH01 4.5	25/11/2020	SOIL	X											1
19	BH01 4.75	25/11/2020	SOIL	X											1
20	BH01 5.0	25/11/2020	SOIL	X											1
21	BH01 5.25	25/11/2020	SOIL	X											1
22	BH01 5.5	25/11/2020	SOIL	X											1
23	BH01 5.75	25/11/2020	SOIL	X											1
24	BH01 6.0	25/11/2020	SOIL	X											1
25	BH01 6.25	25/11/2020	SOIL	X											1
26	BH01 6.5	25/11/2020	SOIL				X								1
27	BH01 6.75	25/11/2020	SOIL				X								1
28	BH01 7.0	25/11/2020	SOIL				X								1
29	BH01 7.25	25/11/2020	SOIL				X								1
30	BH01 7.5	25/11/2020	SOIL				X								1

Special Directions & Comments :

Relinquished By:	Received By: Monique Jackson	Turn around Time :	Method Of Shipment :
Date & Time :	Date & Time : 1/12/20 10:23am		Courier: Yes
Signature:	Signature:	Comments : Please provide preliminary report for pH Field & Fox results.	Hand Delivered:
	Report Number : 761067		Postal:

WESTERN ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Company Name : WESTERN ENVIRONMENTAL PTY LTD	Contact Name : Ruth Allen	Purchase Order : 20.227	CoC Number : 1942
Office Address : Level 3, 25 Prowse Street, West Perth, WA 6005	Project Manager : Ruth Allen	Project Number : 20.227	Quote ID : 190301W
Laboratory Address : mgt-Eurofins Unit 2, 91 Leach Hwy Kewdale WA 6105 Contact: Rob Johnston, +61 (0)8 9251 9605, +61 (0)4 2357 9286 Email: Robertjohnston@eurofins.com	Email for results: ruth.a@westenv.com.au CC: james.g@westenv.com.au 0		Courier Consignment # :

#	Sample ID	Sample Date	Matrix	Analytes: pH Field & Fox	SPOCAS	Suite B9: TRH, BTEXN, PAH, OCP, Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg)	HOLD	Container: 1L-Green	250ml Green	Black MB plastic	100ml Red Plastic	100ml Purple Plastic	VIAL	Glass Jar	ASS Soil Bag
31	BH01 7.75	25/11/2020	SOIL				X								1
32	BH01 8.0	25/11/2020	SOIL				X								1
33	BH01 8.25	25/11/2020	SOIL				X								1
34	BH01 8.5	25/11/2020	SOIL				X								1
35	BH01 8.75	25/11/2020	SOIL				X								1
36	BH01 9.0	25/11/2020	SOIL				X								1
37	BH01 9.25	25/11/2020	SOIL				X								1
38	BH01 9.5	25/11/2020	SOIL				X								1
39	BH01 9.75	25/11/2020	SOIL				X								1
40	BH01 10.0	25/11/2020	SOIL				X								1
41	BH01 10.25	25/11/2020	SOIL				X								1
42	BH01 10.5	25/11/2020	SOIL				X								1
43	BH01 10.75	25/11/2020	SOIL				X								1
44	BH01 11.0	25/11/2020	SOIL				X								1
45	BH01 11.25	25/11/2020	SOIL				X								1

Special Directions & Comments :

Relinquished By:	Received By: Monique Jackson	Turn around Time :	Method Of Shipment :
Date & Time :	Date & Time : 1/12/20 10:23 am		Courier: Yes
Signature:	Signature:	Comments : Please provide preliminary report for pH Field & Fox results.	Hand Delivered:
	Report Number : 761067		Postal:

WESTERN ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Company Name : WESTERN ENVIRONMENTAL PTY LTD	Contact Name : Ruth Allen	Purchase Order : 20.227	CoC Number : 1942
Office Address : Level 3, 25 Prowse Street, West Perth, WA 6005	Project Manager : Ruth Allen	Project Number : 20.227	Quote ID : 190301W
Laboratory Address : mgt-Eurofins Unit 2, 91 Leach Hwy Kewdale WA 6105 Contact: Rob Johnston, +61 (0)8 9251 9605, +61 (0)4 2357 9286 Email: Robertjohnston@eurofins.com	Email for results: ruth.a@westenv.com.au	CC: james.g@westenv.com.au 0	Courier Consignment # :

#	Sample ID	Sample Date	Matrix	pH Field & Fox	SPOCAS	Suite B9: TRH, BTEXN, PAH, OCP, Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg)	HOLD	Container: 1L-Green	250ml Green	Black MB plastic	100ml Red Plastic	100ml Purple Plastic	VIAL	Glass Jar	ASS Soil Bag
46	BH01 11.5	25/11/2020	SOIL				X								1
47	BH01 11.75	25/11/2020	SOIL				X								1
48	BH01 12.0	25/11/2020	SOIL				X								1
49	BH01 12.25	25/11/2020	SOIL				X								1
50	BH01 12.5	25/11/2020	SOIL				X								1
51	BH01 12.75	25/11/2020	SOIL				X								1
52	BH01 13.00	25/11/2020	SOIL				X								1
53	BH01 13.25	25/11/2020	SOIL				X								1
54	BH01 13.5	25/11/2020	SOIL				X								1
55	BH01 13.75	25/11/2020	SOIL				X								1
56	BH01 14.0	25/11/2020	SOIL				X								1
57	BH01 14.25	25/11/2020	SOIL				X								1
58	BH01 14.5	25/11/2020	SOIL				X								1
59	BH01 14.75	25/11/2020	SOIL				X								1
60	BH01 15.0	25/11/2020	SOIL				X								1

Analytes

Special Directions & Comments :

Relinquished By:	Received By: Monique Jackson	Turn around Time :	Method Of Shipment :
Date & Time :	Date & Time : 1/12/20 10:23am		Courier: Yes
Signature:	Signature:	Comments : Please provide preliminary report for pH Field & Fox results.	Hand Delivered:
	Report Number : 761087		Postal:

WESTERN ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Company Name : WESTERN ENVIRONMENTAL PTY LTD	Contact Name : Ruth Allen	Purchase Order : 20.227	CoC Number : 1942
Office Address : Level 3, 25 Prowse Street, West Perth, WA 6005	Project Manager : Ruth Allen	Project Number : 20.227	Quote ID : 190301W
Laboratory Address : mgt-Eurofins Unit 2, 91 Leach Hwy Kewdale WA 6105 Contact: Rob Johnston, +61 (0)8 9251 9605, +61 (0)4 2357 9286 Email: Robertjohnston@eurofins.com	Email for results: ruth.a@westenv.com.au CC: james.g@westenv.com.au 0		Courier Consignment # :

#	Sample ID	Sample Date	Matrix	Analytes: pH Field & Fox	SPOCAS	Suite B9: TRH, BTEXN, PAH, OCP, Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg)	HOLD	Special Directions & Comments :	Container: 1L-Green	250ml Green	Black MB plastic	100ml Red Plastic	100ml Purple Plastic	VIAL	Glass Jar	ASS Soil Bag
76	BH01 19.0	25/11/2020	SOIL				X									1
77	BH01 19.25	25/11/2020	SOIL				X									1
78	BH01 19.5	25/11/2020	SOIL				X									1
79	BH01 19.75	25/11/2020	SOIL				X									1
80	BH01 20.0	25/11/2020	SOIL				X									1
81	BH01 0.0	25/11/2020	SOIL			X									1	1
82		25/11/2020	SOIL													
83		25/11/2020	SOIL													
84		25/11/2020	SOIL													
85		25/11/2020	SOIL													
86		25/11/2020	SOIL													
87		25/11/2020	SOIL													
88		25/11/2020	SOIL													
89		25/11/2020	SOIL													
90		25/11/2020	SOIL													

Relinquished By:	Received By: Monique Jackson	Turn around Time :	Method Of Shipment :
Date & Time :	Date & Time : 1/12/20 10:23 am		Courier: Yes
Signature:	Signature:	Comments : Please provide preliminary report for pH Field & Fox results.	Hand Delivered:
	Report Number : 761067		Postal:

CHAIN OF CUSTODY RECORD

WESTERN ENVIRONMENTAL

Page 5 of

Company Name : WESTERN ENVIRONMENTAL PTY LTD	Contact Name : Ruth Allen	Purchase Order : 20.227	CoC Number : 1942
Office Address : Level 3, 25 Prowse Street, West Perth, WA 6005	Project Manager : Ruth Allen	Project Number : 20.227	Quote ID : 190301W
Laboratory Address : mgt-Eurofins Unit 2, 91 Leach Hwy Kewdale WA 6105 Contact: Rob Johnston, +61 (0)8 9251 9605, +61 (0)4 2357 9286 Email: Robertjohnston@eurofins.com	Email for results: ruth.a@westenv.com.au	CC: james.g@westenv.com.au 0	Courier Consignment # :

#	Sample ID	Sample Date	Matrix	pH Field & Fox	SPOCAS	Suite B9: TRH, BTEXN, PAH, OCP, Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg)	HOLD								Container: 1L-Green	Container: 250ml Green	Container: Black MB plastic	Container: 100ml Red Plastic	Container: 100ml Purple Plastic	Container: VIAL	Container: Glass Jar	ASS Soil Bag
				Analytes																		
61	BH01 15.25	25/11/2020	SOIL				X															1
62	BH01 15.5	25/11/2020	SOIL				X															1
63	BH01 15.75	25/11/2020	SOIL				X															1
64	BH01 16.0	25/11/2020	SOIL				X															1
65	BH01 16.25	25/11/2020	SOIL				X															1
66	BH01 16.5	25/11/2020	SOIL				X															1
67	BH01 16.75	25/11/2020	SOIL				X															1
68	BH01 17.0	25/11/2020	SOIL				X															1
69	BH01 17.25	25/11/2020	SOIL				X															1
70	BH01 17.5	25/11/2020	SOIL				X															1
71	BH01 17.75	25/11/2020	SOIL				X															1
72	BH01 18.0	25/11/2020	SOIL				X															1
73	BH01 18.25	25/11/2020	SOIL				X															1
74	BH01 18.5	25/11/2020	SOIL				X															1
75	BH01 18.75	25/11/2020	SOIL				X															1

Special Directions & Comments :

Relinquished By:	Received By: Monique Jackson	Turn around Time :	Method Of Shipment :
Date & Time :	Date & Time : 1/12/20 10:23am		Courier: Yes
Signature:	Signature:	Comments : Please provide preliminary report for pH Field & Fox results.	Hand Delivered
	Report Number : 761067		Postal

Western Environmental Pty Ltd
Level 3, 25 Prowse Street
West Perth
WA 6005

Attention: **Ruth Allen**

Report **761067-S**
Project name
Project ID 20.227
Received Date Dec 01, 2020

Client Sample ID			**BH01 0.25**	**BH01 0.5**	**BH01 0.75**	**BH01 1.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**P20-De06958**	**P20-De06959**	**P20-De06960**	**P20-De06961**
Date Sampled			**Nov 25, 2020**	**Nov 25, 2020**	**Nov 25, 2020**	**Nov 25, 2020**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.9	9.6	9.7	9.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.7	7.5	7.6	7.6
Reaction Ratings*[S05]	-	comment	2.0	2.0	2.0	3.0
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	-	-
TRH C10-C14	20	mg/kg	-	< 20	-	-
TRH C15-C28	50	mg/kg	-	< 50	-	-
TRH C29-C36	50	mg/kg	-	< 50	-	-
TRH C10-C36 (Total)	50	mg/kg	-	< 50	-	-
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	-	-
Toluene	0.1	mg/kg	-	< 0.1	-	-
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	-
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-	-
o-Xylene	0.1	mg/kg	-	< 0.1	-	-
Xylenes - Total*	0.3	mg/kg	-	< 0.3	-	-
4-Bromofluorobenzene (surr.)	1	%	-	87	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	-	-
TRH C6-C10	20	mg/kg	-	< 20	-	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	-	-
Acenaphthene	0.5	mg/kg	-	< 0.5	-	-
Acenaphthylene	0.5	mg/kg	-	< 0.5	-	-
Anthracene	0.5	mg/kg	-	< 0.5	-	-
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	-	-
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	-	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	< 0.5	-	-
Benzo(g.h.i)perylene	0.5	mg/kg	-	< 0.5	-	-
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	-	-
Chrysene	0.5	mg/kg	-	< 0.5	-	-

Client Sample ID			BH01 0.25	BH01 0.5	BH01 0.75	BH01 1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De06958	P20-De06959	P20-De06960	P20-De06961
Date Sampled			Nov 25, 2020	Nov 25, 2020	Nov 25, 2020	Nov 25, 2020
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5	-	-
Fluoranthene	0.5	mg/kg	-	< 0.5	-	-
Fluorene	0.5	mg/kg	-	< 0.5	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	-	-
Naphthalene	0.5	mg/kg	-	< 0.5	-	-
Phenanthrene	0.5	mg/kg	-	< 0.5	-	-
Pyrene	0.5	mg/kg	-	< 0.5	-	-
Total PAH*	0.5	mg/kg	-	< 0.5	-	-
2-Fluorobiphenyl (surr.)	1	%	-	76	-	-
p-Terphenyl-d14 (surr.)	1	%	-	68	-	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	-
a-BHC	0.05	mg/kg	-	< 0.05	-	-
Aldrin	0.05	mg/kg	-	< 0.05	-	-
b-BHC	0.05	mg/kg	-	< 0.05	-	-
d-BHC	0.05	mg/kg	-	< 0.05	-	-
Dieldrin	0.05	mg/kg	-	< 0.05	-	-
Endosulfan I	0.05	mg/kg	-	< 0.05	-	-
Endosulfan II	0.05	mg/kg	-	< 0.05	-	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	-
Endrin	0.05	mg/kg	-	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	-
Endrin ketone	0.05	mg/kg	-	< 0.05	-	-
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	-	-
Heptachlor	0.05	mg/kg	-	< 0.05	-	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	-
Methoxychlor	0.05	mg/kg	-	< 0.05	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	-	-
Dibutylchlorendate (surr.)	1	%	-	99	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	62	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	-	< 50	-	-
TRH >C16-C34	100	mg/kg	-	< 100	-	-
TRH >C34-C40	100	mg/kg	-	< 100	-	-
TRH >C10-C40 (total)*	100	mg/kg	-	< 100	-	-
Heavy Metals						
Arsenic	2	mg/kg	-	< 2	-	-
Cadmium	0.4	mg/kg	-	< 0.4	-	-
Chromium	5	mg/kg	-	12	-	-
Copper	5	mg/kg	-	< 5	-	-
Lead	5	mg/kg	-	30	-	-
Mercury	0.1	mg/kg	-	< 0.1	-	-

Client Sample ID			BH01 0.25	BH01 0.5	BH01 0.75	BH01 1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De06958	P20-De06959	P20-De06960	P20-De06961
Date Sampled			Nov 25, 2020	Nov 25, 2020	Nov 25, 2020	Nov 25, 2020
Test/Reference	LOR	Unit				
Heavy Metals						
Nickel	5	mg/kg	-	< 5	-	-
Zinc	5	mg/kg	-	29	-	-
% Moisture	1	%	-	7.7	-	-

Client Sample ID			BH01 1.25	BH01 1.5	BH01 1.75	BH01 2.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De06962	P20-De06963	P20-De06964	P20-De06965
Date Sampled			Nov 25, 2020	Nov 25, 2020	Nov 25, 2020	Nov 25, 2020
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.5	9.6	9.6	9.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.5	7.2	7.4	7.6
Reaction Ratings*[S05]	-	comment	3.0	2.0	2.0	2.0

Client Sample ID			BH01 2.25	BH01 2.5	BH01 2.75	BH01 3.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De06966	P20-De06967	P20-De06968	P20-De06969
Date Sampled			Nov 25, 2020	Nov 25, 2020	Nov 25, 2020	Nov 25, 2020
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.4	8.4	7.8	9.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.5	5.4	2.9	7.4
Reaction Ratings*[S05]	-	comment	2.0	3.0	2.0	2.0

Client Sample ID			BH01 3.25	BH01 3.5	BH01 3.75	BH01 4.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De06970	P20-De06971	P20-De06972	P20-De06973
Date Sampled			Nov 25, 2020	Nov 25, 2020	Nov 25, 2020	Nov 25, 2020
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.8	7.7	7.5	7.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.4	3.0	2.9	2.8
Reaction Ratings*[S05]	-	comment	2.0	2.0	1.0	1.0

Client Sample ID			BH01 4.25	BH01 4.5	BH01 4.75	BH01 5.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De06974	P20-De06975	P20-De06976	P20-De06977
Date Sampled			Nov 25, 2020	Nov 25, 2020	Nov 25, 2020	Nov 25, 2020
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.3	9.8	9.5	6.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.4	6.2	6.8	3.4
Reaction Ratings*[S05]	-	comment	2.0	2.0	2.0	2.0

Client Sample ID			BH 5.25	BH01 5.5	BH01 5.75	BH01 6.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De06978	P20-De06979	P20-De06980	P20-De06981
Date Sampled			Nov 25, 2020	Nov 25, 2020	Nov 25, 2020	Nov 25, 2020
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.8	9.4	9.5	9.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.8	6.7	6.9	5.5
Reaction Ratings*[S05]	-	comment	2.0	2.0	2.0	2.0

Client Sample ID			BH01 6.25	BH01 0.0
Sample Matrix			Soil	Soil
Eurofins Sample No.			P20-De06982	P20-De07038
Date Sampled			Nov 25, 2020	Nov 25, 2020
Test/Reference	LOR	Unit		
Acid Sulfate Soils Field pH Test				
pH-F (Field pH test)*	0.1	pH Units	9.6	-
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.4	-
Reaction Ratings*[S05]	-	comment	2.0	-
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	20	mg/kg	-	< 20
TRH C10-C14	20	mg/kg	-	< 20
TRH C15-C28	50	mg/kg	-	< 50
TRH C29-C36	50	mg/kg	-	< 50
TRH C10-C36 (Total)	50	mg/kg	-	< 50
BTEX				
Benzene	0.1	mg/kg	-	< 0.1
Toluene	0.1	mg/kg	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	< 0.2
o-Xylene	0.1	mg/kg	-	< 0.1
Xylenes - Total*	0.3	mg/kg	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	107
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.5	mg/kg	-	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50
TRH C6-C10	20	mg/kg	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20

Client Sample ID			BH01 6.25	BH01 0.0
Sample Matrix			Soil	Soil
Eurofins Sample No.			P20-De06982	P20-De07038
Date Sampled			Nov 25, 2020	Nov 25, 2020
Test/Reference	LOR	Unit		
Polycyclic Aromatic Hydrocarbons				
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2
Acenaphthene	0.5	mg/kg	-	< 0.5
Acenaphthylene	0.5	mg/kg	-	< 0.5
Anthracene	0.5	mg/kg	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5
Chrysene	0.5	mg/kg	-	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5
Fluoranthene	0.5	mg/kg	-	< 0.5
Fluorene	0.5	mg/kg	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5
Naphthalene	0.5	mg/kg	-	< 0.5
Phenanthrene	0.5	mg/kg	-	< 0.5
Pyrene	0.5	mg/kg	-	< 0.5
Total PAH*	0.5	mg/kg	-	< 0.5
2-Fluorobiphenyl (surr.)	1	%	-	74
p-Terphenyl-d14 (surr.)	1	%	-	80
Organochlorine Pesticides				
Chlordanes - Total	0.1	mg/kg	-	< 0.1
4.4'-DDD	0.05	mg/kg	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	< 0.05
a-BHC	0.05	mg/kg	-	< 0.05
Aldrin	0.05	mg/kg	-	< 0.05
b-BHC	0.05	mg/kg	-	< 0.05
d-BHC	0.05	mg/kg	-	< 0.05
Dieldrin	0.05	mg/kg	-	< 0.05
Endosulfan I	0.05	mg/kg	-	< 0.05
Endosulfan II	0.05	mg/kg	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	< 0.05
Endrin	0.05	mg/kg	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	< 0.05
Endrin ketone	0.05	mg/kg	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05
Heptachlor	0.05	mg/kg	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	< 0.05
Methoxychlor	0.05	mg/kg	-	< 0.05
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	89
Tetrachloro-m-xylene (surr.)	1	%	-	53

Client Sample ID			BH01 6.25	BH01 0.0
Sample Matrix			Soil	Soil
Eurofins Sample No.			P20-De06982	P20-De07038
Date Sampled			Nov 25, 2020	Nov 25, 2020
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
TRH >C10-C16	50	mg/kg	-	< 50
TRH >C16-C34	100	mg/kg	-	< 100
TRH >C34-C40	100	mg/kg	-	< 100
TRH >C10-C40 (total)*	100	mg/kg	-	< 100
Heavy Metals				
Arsenic	2	mg/kg	-	3.5
Cadmium	0.4	mg/kg	-	< 0.4
Chromium	5	mg/kg	-	10
Copper	5	mg/kg	-	< 5
Lead	5	mg/kg	-	< 5
Mercury	0.1	mg/kg	-	< 0.1
Nickel	5	mg/kg	-	< 5
Zinc	5	mg/kg	-	8.2
% Moisture	1	%	-	8.4

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	Perth	Dec 03, 2020	7 Days
- Method: LTM-GEN- 7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests			
Eurofins Suite B9			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Perth	Dec 04, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Perth	Dec 04, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Perth	Dec 04, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Perth	Dec 04, 2020	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Organochlorine Pesticides	Perth	Dec 04, 2020	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Perth	Dec 04, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Metals M8	Perth	Dec 04, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters Soils Sediments by ICP-MS			
% Moisture	Perth	Dec 03, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

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

Company Name: Western Environmental Pty Ltd
Address: Level 3, 25 Prowse Street
West Perth
WA 6005

Project Name:
Project ID: 20.227

Order No.:
Report #: 761067
Phone: 08 6162 8980
Fax:

Received: Dec 1, 2020 10:23 AM
Due: Dec 8, 2020
Priority: 5 Day
Contact Name: Ruth Allen

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Eurofins Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736						X	X	X	X
Mayfield Laboratory									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	BH01 0.25	Nov 25, 2020		Soil	P20-De06958		X		
2	BH01 0.5	Nov 25, 2020		Soil	P20-De06959		X	X	X
3	BH01 0.75	Nov 25, 2020		Soil	P20-De06960		X		
4	BH01 1.0	Nov 25, 2020		Soil	P20-De06961		X		
5	BH01 1.25	Nov 25, 2020		Soil	P20-De06962		X		
6	BH01 1.5	Nov 25, 2020		Soil	P20-De06963		X		
7	BH01 1.75	Nov 25, 2020		Soil	P20-De06964		X		
8	BH01 2.0	Nov 25, 2020		Soil	P20-De06965		X		
9	BH01 2.25	Nov 25, 2020		Soil	P20-De06966		X		

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

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

Company Name: Western Environmental Pty Ltd
Address: Level 3, 25 Prowse Street
West Perth
WA 6005

Project Name:
Project ID: 20.227

Order No.:
Report #: 761067
Phone: 08 6162 8980
Fax:

Received: Dec 1, 2020 10:23 AM
Due: Dec 8, 2020
Priority: 5 Day
Contact Name: Ruth Allen

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Eurofins Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736						X	X	X	X
Mayfield Laboratory									
External Laboratory									
10	BH01 2.5	Nov 25, 2020		Soil	P20-De06967		X		
11	BH01 2.75	Nov 25, 2020		Soil	P20-De06968		X		
12	BH01 3.0	Nov 25, 2020		Soil	P20-De06969		X		
13	BH01 3.25	Nov 25, 2020		Soil	P20-De06970		X		
14	BH01 3.5	Nov 25, 2020		Soil	P20-De06971		X		
15	BH01 3.75	Nov 25, 2020		Soil	P20-De06972		X		
16	BH01 4.0	Nov 25, 2020		Soil	P20-De06973		X		
17	BH01 4.25	Nov 25, 2020		Soil	P20-De06974		X		
18	BH01 4.5	Nov 25, 2020		Soil	P20-De06975		X		
19	BH01 4.75	Nov 25, 2020		Soil	P20-De06976		X		
20	BH01 5.0	Nov 25, 2020		Soil	P20-De06977		X		

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

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

Company Name: Western Environmental Pty Ltd
Address: Level 3, 25 Prowse Street
West Perth
WA 6005

Project Name:
Project ID: 20.227

Order No.:
Report #: 761067
Phone: 08 6162 8980
Fax:

Received: Dec 1, 2020 10:23 AM
Due: Dec 8, 2020
Priority: 5 Day
Contact Name: Ruth Allen

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Eurofins Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736						X	X	X	X
Mayfield Laboratory									
External Laboratory									
21	BH 5.25	Nov 25, 2020		Soil	P20-De06978		X		
22	BH01 5.5	Nov 25, 2020		Soil	P20-De06979		X		
23	BH01 5.75	Nov 25, 2020		Soil	P20-De06980		X		
24	BH01 6.0	Nov 25, 2020		Soil	P20-De06981		X		
25	BH01 6.25	Nov 25, 2020		Soil	P20-De06982		X		
26	BH01 6.5	Nov 25, 2020		Soil	P20-De06983	X			
27	BH01 6.75	Nov 25, 2020		Soil	P20-De06984	X			
28	BH01 7.0	Nov 25, 2020		Soil	P20-De06985	X			
29	BH01 7.25	Nov 25, 2020		Soil	P20-De06986	X			
30	BH01 7.5	Nov 25, 2020		Soil	P20-De06987	X			
31	BH01 7.75	Nov 25, 2020		Soil	P20-De06988	X			

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

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

Company Name: Western Environmental Pty Ltd
Address: Level 3, 25 Prowse Street
West Perth
WA 6005

Project Name:
Project ID: 20.227

Order No.:
Report #: 761067
Phone: 08 6162 8980
Fax:

Received: Dec 1, 2020 10:23 AM
Due: Dec 8, 2020
Priority: 5 Day
Contact Name: Ruth Allen

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Eurofins Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736						X	X	X	X
Mayfield Laboratory									
External Laboratory									
32	BH01 8.0	Nov 25, 2020		Soil	P20-De06989	X			
33	BH01 8.25	Nov 25, 2020		Soil	P20-De06990	X			
34	BH01 8.5	Nov 25, 2020		Soil	P20-De06991	X			
35	BH01 8.75	Nov 25, 2020		Soil	P20-De06992	X			
36	BH01 9.0	Nov 25, 2020		Soil	P20-De06993	X			
37	BH01 9.5	Nov 25, 2020		Soil	P20-De06995	X			
38	BH01 9.75	Nov 25, 2020		Soil	P20-De06996	X			
39	BH01 10.0	Nov 25, 2020		Soil	P20-De06997	X			
40	BH01 11.0	Nov 25, 2020		Soil	P20-De07001	X			
41	BH01 11.25	Nov 25, 2020		Soil	P20-De07002	X			
42	BH01 11.5	Nov 25, 2020		Soil	P20-De07003	X			

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

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

Company Name: Western Environmental Pty Ltd
Address: Level 3, 25 Prowse Street
West Perth
WA 6005

Project Name:
Project ID: 20.227

Order No.:
Report #: 761067
Phone: 08 6162 8980
Fax:

Received: Dec 1, 2020 10:23 AM
Due: Dec 8, 2020
Priority: 5 Day
Contact Name: Ruth Allen

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Eurofins Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736						X	X	X	X
Mayfield Laboratory									
External Laboratory									
43	BH01 11.75	Nov 25, 2020		Soil	P20-De07004	X			
44	BH01 12.0	Nov 25, 2020		Soil	P20-De07005	X			
45	BH01 12.25	Nov 25, 2020		Soil	P20-De07006	X			
46	BH01 12.5	Nov 25, 2020		Soil	P20-De07007	X			
47	BH01 12.75	Nov 25, 2020		Soil	P20-De07008	X			
48	BH01 13.0	Nov 25, 2020		Soil	P20-De07009	X			
49	BH01 13.25	Nov 25, 2020		Soil	P20-De07010	X			
50	BH01 13.5	Nov 25, 2020		Soil	P20-De07011	X			
51	BH01 13.75	Nov 25, 2020		Soil	P20-De07012	X			
52	BH01 14.0	Nov 25, 2020		Soil	P20-De07013	X			
53	BH01 14.25	Nov 25, 2020		Soil	P20-De07014	X			

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

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

Company Name: Western Environmental Pty Ltd
Address: Level 3, 25 Prowse Street
West Perth
WA 6005

Project Name:
Project ID: 20.227

Order No.:
Report #: 761067
Phone: 08 6162 8980
Fax:

Received: Dec 1, 2020 10:23 AM
Due: Dec 8, 2020
Priority: 5 Day
Contact Name: Ruth Allen

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Eurofins Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736						X	X	X	X
Mayfield Laboratory									
External Laboratory									
54	BH01 14.5	Nov 25, 2020		Soil	P20-De07015	X			
55	BH01 14.75	Nov 25, 2020		Soil	P20-De07016	X			
56	BH01 15.0	Nov 25, 2020		Soil	P20-De07017	X			
57	BH01 15.25	Nov 25, 2020		Soil	P20-De07018	X			
58	BH01 15.5	Nov 25, 2020		Soil	P20-De07019	X			
59	BH01 15.75	Nov 25, 2020		Soil	P20-De07020	X			
60	BH01 16.0	Nov 25, 2020		Soil	P20-De07021	X			
61	BH01 16.25	Nov 25, 2020		Soil	P20-De07022	X			
62	BH01 16.75	Nov 25, 2020		Soil	P20-De07024	X			
63	BH01 17.0	Nov 25, 2020		Soil	P20-De07025	X			
64	BH01 17.25	Nov 25, 2020		Soil	P20-De07026	X			

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

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

Company Name: Western Environmental Pty Ltd
Address: Level 3, 25 Prowse Street
West Perth
WA 6005

Project Name:
Project ID: 20.227

Order No.:
Report #: 761067
Phone: 08 6162 8980
Fax:

Received: Dec 1, 2020 10:23 AM
Due: Dec 8, 2020
Priority: 5 Day
Contact Name: Ruth Allen

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Eurofins Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736						X	X	X	X
Mayfield Laboratory									
External Laboratory									
65	BH01 17.5	Nov 25, 2020		Soil	P20-De07027	X			
66	BH01 18.0	Nov 25, 2020		Soil	P20-De07029	X			
67	BH01 18.25	Nov 25, 2020		Soil	P20-De07030	X			
68	BH0118.5	Nov 25, 2020		Soil	P20-De07031	X			
69	BH01 18.75	Nov 25, 2020		Soil	P20-De07032	X			
70	BH01 19.0	Nov 25, 2020		Soil	P20-De07033	X			
71	BH01 19.25	Nov 25, 2020		Soil	P20-De07034	X			
72	BH01 19.5	Nov 25, 2020		Soil	P20-De07035	X			
73	BH01 19.75	Nov 25, 2020		Soil	P20-De07036	X			
74	BH01 20.0	Nov 25, 2020		Soil	P20-De07037	X			
75	BH01 0.0	Nov 25, 2020		Soil	P20-De07038			X	X

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

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

Company Name: Western Environmental Pty Ltd
Address: Level 3, 25 Prowse Street
West Perth
WA 6005

Project Name:
Project ID: 20.227

Order No.:
Report #: 761067
Phone: 08 6162 8980
Fax:

Received: Dec 1, 2020 10:23 AM
Due: Dec 8, 2020
Priority: 5 Day
Contact Name: Ruth Allen

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail	HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Eurofins Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271				
Sydney Laboratory - NATA Site # 18217				
Brisbane Laboratory - NATA Site # 20794				
Perth Laboratory - NATA Site # 23736	X	X	X	X
Mayfield Laboratory				
External Laboratory				
Test Counts	49	25	2	2

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

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
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Aldrin and Dieldrin (Total)*	mg/kg	-			0.05	N/A	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	81			70-130	Pass	
4.4'-DDE	%	75			70-130	Pass	
a-BHC	%	87			70-130	Pass	
b-BHC	%	77			70-130	Pass	
d-BHC	%	93			70-130	Pass	
Endosulfan sulphate	%	82			70-130	Pass	
Endrin	%	75			70-130	Pass	
Endrin ketone	%	114			70-130	Pass	
g-BHC (Lindane)	%	82			70-130	Pass	
Heptachlor	%	105			70-130	Pass	
Heptachlor epoxide	%	79			70-130	Pass	
Methoxychlor	%	105			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	91			80-120	Pass	
Cadmium	%	90			80-120	Pass	
Chromium	%	92			80-120	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Copper			%	94			80-120	Pass	
Lead			%	94			80-120	Pass	
Mercury			%	88			80-120	Pass	
Nickel			%	91			80-120	Pass	
Zinc			%	94			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	P20-De06959	CP	%	90			70-130	Pass	
TRH C10-C14	P20-De06959	CP	%	73			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	P20-De06959	CP	%	99			70-130	Pass	
Toluene	P20-De06959	CP	%	99			70-130	Pass	
Ethylbenzene	P20-De06959	CP	%	105			70-130	Pass	
m&p-Xylenes	P20-De06959	CP	%	108			70-130	Pass	
o-Xylene	P20-De06959	CP	%	109			70-130	Pass	
Xylenes - Total*	P20-De06959	CP	%	108			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	P20-De06959	CP	%	104			70-130	Pass	
TRH C6-C10	P20-De06959	CP	%	90			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	P20-De06959	CP	%	71			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	P20-De06959	CP	%	78			75-125	Pass	
Cadmium	P20-De06959	CP	%	87			75-125	Pass	
Chromium	P20-De06959	CP	%	93			75-125	Pass	
Copper	P20-De06959	CP	%	102			75-125	Pass	
Lead	P20-De06959	CP	%	90			75-125	Pass	
Mercury	P20-De06959	CP	%	86			75-125	Pass	
Nickel	P20-De06959	CP	%	86			75-125	Pass	
Zinc	P20-De06959	CP	%	83			75-125	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	P20-De07038	CP	%	83			70-130	Pass	
Acenaphthylene	P20-De07038	CP	%	123			70-130	Pass	
Anthracene	P20-De07038	CP	%	117			70-130	Pass	
Benzo(a)pyrene	P20-De07038	CP	%	83			70-130	Pass	
Dibenz(a.h)anthracene	P20-De07038	CP	%	102			70-130	Pass	
Fluoranthene	P20-De07038	CP	%	74			70-130	Pass	
Fluorene	P20-De07038	CP	%	81			70-130	Pass	
Indeno(1.2.3-cd)pyrene	P20-De07038	CP	%	113			70-130	Pass	
Naphthalene	P20-De07038	CP	%	85			70-130	Pass	
Phenanthrene	P20-De07038	CP	%	94			70-130	Pass	
Pyrene	P20-De07038	CP	%	83			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	P20-De07038	CP	%	89			70-130	Pass	
4.4'-DDE	P20-De07038	CP	%	78			70-130	Pass	
a-BHC	P20-De07038	CP	%	94			70-130	Pass	
Aldrin	P20-De07038	CP	%	77			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
b-BHC	P20-De07038	CP	%	76			70-130	Pass	
d-BHC	P20-De07038	CP	%	110			70-130	Pass	
Endosulfan II	P20-De07038	CP	%	80			70-130	Pass	
Endosulfan sulphate	P20-De07038	CP	%	85			70-130	Pass	
Endrin	P20-De07038	CP	%	78			70-130	Pass	
Endrin ketone	P20-De07038	CP	%	111			70-130	Pass	
g-BHC (Lindane)	P20-De07038	CP	%	86			70-130	Pass	
Heptachlor	P20-De07038	CP	%	122			70-130	Pass	
Heptachlor epoxide	P20-De07038	CP	%	85			70-130	Pass	
Methoxychlor	P20-De07038	CP	%	114			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)*	P20-De06958	CP	pH Units	8.9	8.8	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	P20-De06958	CP	pH Units	7.7	7.6	pass	30%	Pass	
Reaction Ratings*	P20-De06958	CP	comment	2.0	2.0	pass	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	P20-De06959	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	P20-De06959	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	P20-De06959	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	P20-De06959	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	P20-De06959	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	P20-De06959	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	P20-De06959	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	P20-De06959	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	P20-De06959	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	P20-De06959	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	P20-De06959	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	P20-De06959	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	P20-De06959	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	P20-De06959	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	P20-De06959	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	P20-De06959	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	P20-De06959	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	P20-De06959	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	P20-De06959	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	P20-De06959	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	P20-De06959	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	P20-De06959	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	P20-De06959	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	P20-De06959	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	P20-De06959	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	P20-De06959	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	P20-De06959	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	P20-De06959	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	P20-De06959	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	P20-De06959	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	P20-De06959	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	P20-De06959	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Endrin aldehyde	P20-De06959	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	P20-De06959	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	P20-De06959	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	P20-De06959	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	P20-De06959	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	P20-De06959	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	P20-De06959	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	P20-De06959	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	P20-De06959	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	P20-De06959	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	P20-De06968	CP	pH Units	7.8	7.9	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	P20-De06968	CP	pH Units	2.9	2.9	pass	30%	Pass	
Reaction Ratings*	P20-De06968	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)*	P20-De06978	CP	pH Units	9.8	9.7	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	P20-De06978	CP	pH Units	7.8	7.8	pass	30%	Pass	
Reaction Ratings*	P20-De06978	CP	comment	2.0	2.0	pass	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	P20-De07038	CP	mg/kg	3.5	3.2	10	30%	Pass	
Cadmium	P20-De07038	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	P20-De07038	CP	mg/kg	10	9.0	11	30%	Pass	
Copper	P20-De07038	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	P20-De07038	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Mercury	P20-De07038	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	P20-De07038	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	P20-De07038	CP	mg/kg	8.2	7.4	10	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	No
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised By

Rhys Thomas	Analytical Services Manager
Elden Garrett	Senior Analyst-Metal (WA)
Patrick Patfield	Senior Analyst-Organic (WA)
Patrick Patfield	Senior Analyst-Volatile (WA)
Rhys Thomas	Senior Analyst-SPOCAS (WA)

Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

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

WESTERN ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Company Name : WESTERN ENVIRONMENTAL PTY LTD	Contact Name : Ruth Allen	Purchase Order : 20.227	CoC Number : 1950
Office Address : Level 3, 25 Prowse Street, West Perth, WA 6005	Project Manager : Ruth Allen	Project Number : 20.227	Quote ID : 190301W
Laboratory Address : mgt-Eurofins Unit 2, 91 Leach Hwy Kewdale WA 6105 Contact: Rob Johnston, +61 (0)8 9251 9605, +61 (0)4 2357 9286 Email: Robertjohnston@eurofins.com	Email for results: ruth.a@westenv.com.au	CC 1 & 2: james.g@westenv.com.au leah.p@westenv.com.au	Courier Consignment # :

Special Directions & Comments :

#	Sample ID	Sample Date	Matrix	pH Field & Fox	SPOCAS	Suite B9: TRH, BTEXN, PAH, OCP, Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg)	HOLD	1L-Green	250ml Green	Black MB plastic	100ml Red Plastic	100ml Purple Plastic	VIAL	Glass Jar	ASS Soil Bag
1	BH02 0.0	30/11/2020	SOIL	X		X								1	1
2	BH02 0.25		SOIL	X											1
3	BH02 0.5		SOIL	X		X								1	1
4	BH02 0.75		SOIL	X											1
5	BH02 1.0		SOIL	X			X							1	1
6	BH02 1.25		SOIL	X											1
7	BH02 1.50		SOIL	X			X							1	1
8	BH02 1.75		SOIL	X											1
9	BH02 2.0		SOIL	X			X							1	1
10	BH02 2.25		SOIL	X											1
11	BH02 2.5		SOIL	X											1
12	BH02 2.75		SOIL	X											1
13	BH02 3.0		SOIL	X											1
14	BH02 3.25		SOIL	X											1
15	BH02 3.5		SOIL	X											1

2/12 4°C

Relinquished By: Leah Petrie	Received By: D Thomas	Turn around Time : 5 Days	Method Of Shipment :
Date & Time : 2/12/2020	Date & Time : 2/12 5:05pm		Courier: x
Signature:	Signature:	Comments : Please provide preliminary report for pH Field & Fox results.	Hand Delivered
	Report Number : 761096		Postal

WESTERN ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Company Name : WESTERN ENVIRONMENTAL PTY LTD	Contact Name : Ruth Allen	Purchase Order : 20.227	CoC Number : 1950
Office Address : Level 3, 25 Prowse Street, West Perth, WA 6005	Project Manager : Ruth Allen	Project Number : 20.227	Quote ID : 190301W
Laboratory Address : mgt-Eurofins Unit 2, 91 Leach Hwy Kewdale WA 6105 Contact: Rob Johnston, +61 (0)8 9251 9605, +61 (0)4 2357 9286 Email: Robertjohnston@eurofins.com	Email for results: ruth.a@westenv.com.au	CC: james.g@westenv.com.au leah.p@westenv.com.au	Courier Consignment # :

#	Sample ID	Sample Date	Matrix	pH Field & Fox	SPOCAS	Suite B9: TRH, BTEXN, PAH, OCP, Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg)	HOLD	Special Directions & Comments :	Container: 1L-Green	250ml Green	Black MB plastic	100ml Red Plastic	100ml Purple Plastic	VIAL	Glass Jar	ASS Soil Bag
16	BH01 3.75		SOIL	X												1
17	BH02 4.0		SOIL	X												1
18	BH02 4.25		SOIL	X												1
19	BH02 4.5		SOIL	X												1
20	BH02 4.75		SOIL	X												1
21	BH02 5.0		SOIL	X												1
22	BH02 5.25		SOIL	X												1
23	BH02 5.5		SOIL	X												1
24	BH02 5.75		SOIL	X												1
25	BH02 6.0		SOIL	X												1
26	BH02 6.25		SOIL				X									1
27	BH02 6.5		SOIL				X									1
28	BH02 6.75		SOIL				X									1
29	BH02 7.0		SOIL				X									1
30	BH02 7.25		SOIL				X									1

Analytes

Relinquished By: _Leah Petrie	Received By: D. Thomas	Turn around Time :	Method Of Shipment :
Date & Time :	Date & Time : 2/12 5:05pm		Courier: Yes
Signature:	Signature:	Comments : Please provide preliminary report for pH Field & Fox results.	Hand Delivered:
	Report Number : 761096		Postal:

WESTERN ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Page 3 of

Company Name : WESTERN ENVIRONMENTAL PTY LTD	Contact Name : Ruth Allen	Purchase Order : 20.227	CoC Number : 1950
Office Address : Level 3, 25 Prowse Street, West Perth, WA 6005	Project Manager : Ruth Allen	Project Number : 20.227	Quote ID : 190301W
Laboratory Address : mgt-Eurofins Unit 2, 91 Leach Hwy Kewdale WA 6105 Contact: Rob Johnston, +61 (0)8 9251 9605, +61 (0)4 2357 9286 Email: Robertjohnston@eurofins.com	Email for results: ruth.a@westenv.com.au	CC: james.g@westenv.com.au leah.p@westenv.com.au	Courier Consignment # :

#	Sample ID	Sample Date	Matrix	Analytes: pH Field & Fox	SPOCAS	Suite B9: TRH, BTEXN, PAH, OCP, Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg)	HOLD								Special Directions & Comments :	Container: 1L-Green	250ml Green	Black MB plastic	100ml Red Plastic	100ml Purple Plastic	VIAL	Glass Jar	ASS Soil Bag
31	BH02 7.5	1/12/19	SOIL				X															1
32	BH02 7.75		SOIL				X															1
33	BH02 8.0		SOIL				X															1
34	BH02 8.25		SOIL				X															1
35	BH02 8.5		SOIL				X															1
36	BH02 8.75		SOIL				X															1
37	BH02 9.0		SOIL				X															1
38	BH02 9.25		SOIL				X															1
39	BH02 9.5		SOIL				X															1
40	BH02 9.75		SOIL				X															1
41	BH02 10.0		SOIL				X															1
42	BH02 10.25		SOIL				X															1
43	BH02 10.5		SOIL				X															1
44	BH02 10.75		SOIL				X															1
45	BH02 11.0		SOIL				X															1

Relinquished By: _Leah Petrie	Received By: R. Thomas	Turn around Time :	Method Of Shipment :
Date & Time :	Date & Time : 2/12 5:05pm		Courier: Yes
Signature:	Signature:	Comments : Please provide preliminary report for pH Field & Fox results.	Hand Delivered:
	Report Number : 761096		Postal:

WESTERN ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Company Name : WESTERN ENVIRONMENTAL PTY LTD	Contact Name : Ruth Allen	Purchase Order : 20.227	CoC Number : 1950
Office Address : Level 3, 25 Prowse Street, West Perth, WA 6005	Project Manager : Ruth Allen	Project Number : 20.227	Quote ID : 190301W
Laboratory Address : mgt-Eurofins Unit 2, 91 Leach Hwy Kewdale WA 6105 Contact: Rob Johnston, +61 (0)8 9251 9605, +61 (0)4 2357 9286 Email: Robertjohnston@eurofins.com	Email for results: ruth.a@westenv.com.au	CC: james.g@westenv.com.au leah.p@westenv.com.au	Courier Consignment # :

#	Sample ID	Sample Date	Matrix	pH Field & Fox	SPOCAS	Suite B9: TRH, BTEXN, PAH, OCP, Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg)	HOLD								Container							ASS Soil Bag
															1L-Green	250ml Green	Black MB plastic	100ml Red Plastic	100ml Purple Plastic	VIAL	Glass Jar	
46	BH02 11.25		SOIL				X															1
47	BH02 11.5		SOIL				X															1
48	BH02 11.75		SOIL				X															1
49	BH02 12.0		SOIL				X															1
50	BH02 12.25		SOIL				X															1
51	BH02 12.5		SOIL				X															1
52	BH02 12.75		SOIL				X															1
53	BH02 13.00		SOIL				X															1
54	BH02 13.25		SOIL				X															1
55	BH02 13.5		SOIL				X															1
56	BH02 13.75		SOIL				X															1
57	BH02 14.0		SOIL				X															1
58	BH02 14.25		SOIL				X															1
59	BH02 14.5		SOIL				X															1
60	BH02 14.75		SOIL				X															1

Special Directions & Comments :

Relinquished By: _Leah Petrie	Received By: R Thomas	Turn around Time :	Method Of Shipment :
Date & Time :	Date & Time : 2/12 5:05pm		Courier: Yes
Signature:	Signature:		Hand Delivered:
	Report Number : 761096	Comments : Please provide preliminary report for pH Field & Fox results.	Postal:

CHAIN OF CUSTODY RECORD

WESTERN ENVIRONMENTAL

Company Name : WESTERN ENVIRONMENTAL PTY LTD	Contact Name : Ruth Allen	Purchase Order : 20.227	CoC Number : 1950
Office Address : Level 3, 25 Prowse Street, West Perth, WA 6005	Project Manager : Ruth Allen	Project Number : 20.227	Quote ID : 190301W
Laboratory Address : mgt-Eurofins, Unit 2, 91 Leach Hwy, Kewdale WA 6105, Contact: Rob Johnston, +61 (0)8 9251 9605, +61 (0)4 2357 9286, Email: Robertjohnston@eurofins.com	Email for results: ruth.a@westenv.com.au CC: james.g@westenv.com.au leah.p@westenv.com.au		Courier Consignment # :

#	Sample ID	Sample Date	Matrix	pH Field & Fox	SPOCAS	Suite B9: TRH, BTEXN, PAH, OCP, Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg)	HOLD	Container: 1L-Green	250ml Green	Black MB plastic	100ml Red Plastic	100ml Purple Plastic	VIAL	Glass Jar	ASS Soil Bag
61	BH02 15.0	1/12/20	SOIL				X								1
62	BH02 15.25		SOIL				X								1
63	BH02 15.5		SOIL				X								1
64	BH02 15.75		SOIL				X								1
65	BH02 16.0		SOIL				X								1
66	BH02 16.25		SOIL				X								1
67	BH02 16.5		SOIL				X								1
68	BH02 16.75		SOIL				X								1
69	BH02 17.0		SOIL				X								1
70	BH02 17.25		SOIL				X								1
71	BH02 17.5		SOIL				X								1
72	BH02 17.75		SOIL				X								1
73	BH02 18.0	2/12/20	SOIL				X								1
74	BH02 18.25		SOIL				X								1
75	BH02 18.5		SOIL				X								1

Analytes

Special Directions & Comments :

Relinquished By: Leah Petrie	Received By: R. Thomas	Turn around Time :
Date & Time :	Date & Time : 2/12 5:05 PM	Method Of Shipment :
Signature:	Signature:	Courier: Yes
	Report Number : 761096	Hand Delivered:
		Postal:
		Comments : Please provide preliminary report for pH Field & Fox results.

CHAIN OF CUSTODY RECORD

Company Name : WESTERN ENVIRONMENTAL PTY LTD	Contact Name : Ruth Allen	Purchase Order : 20.227	CoC Number : 1950
Office Address : Level 3, 25 Prowse Street, West Perth, WA 6005	Project Manager : Ruth Allen	Project Number : 20.227	Quote ID : 190301W
Laboratory Address : mgt-Eurofins Unit 2, 91 Leach Hwy Kewdale WA 6105 Contact: Rob Johnston, +61 (0)8 9251 9605, +61 (0)4 2357 9286 Email: Robertjohnston@eurofins.com	Email for results: ruth.a@westenv.com.au	CC: james.g@westenv.com.au leah.p@westenv.com.au	Courier Consignment # :

#	Sample ID	Sample Date	Matrix	pH Field & Fox	SPOCAS	Suite B9: TRH, BTEXN, PAH, OCP, Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg)	HOLD	Special Directions & Comments :	Container: 1L-Green	250ml Green	Black MB plastic	100ml Red Plastic	100ml Purple Plastic	VIAL	Glass Jar	ASS Soil Bag
76	BH02 18.75		SOIL				X									1
77	BH02 19.0		SOIL				X									1
78	BH02 19.25		SOIL				X									1
79	BH02 19.5		SOIL				X									1
80	BH02 19.75		SOIL				X									1
81	BH02 20.0		SOIL				X									1
82			SOIL													
83			SOIL													
84			SOIL													
85			SOIL													
86			SOIL													
87			SOIL													
88			SOIL													
89			SOIL													
90			SOIL													

Relinquished By: _Leah Petrie	Received By: R. Thomas	Turn around Time :	Method Of Shipment :
Date & Time : 2/12/20	Date & Time : 2/12 5:05 PM		Courier: Yes
Signature:	Signature:	Comments : Please provide preliminary report for pH Field & Fox results.	Hand Delivered:
	Report Number : 761096		Postal:

Robert Johnston

From: Leah Petrie <leah.p@westenv.com.au>
Sent: Friday, 4 December 2020 14:40
To: Robert Johnston
Cc: James Gibson; Ruth Allen
Subject: RE: Attention - Eurofins Sample Receipt Advice - Report 761096 : Site 20.227

Follow Up Flag: Follow up
Flag Status: Completed

EXTERNAL EMAIL*

Hi Rob,

These samples were not collected, please exclude from the CoC. Apologies for any inconvenience.

Kind regards,

Leah Petrie

Environmental Scientist
BSc Environmental Science and Conservation Biology

Level 3/25 Prowse St, West Perth WA 6005
P: (08) 6162 8980 **M:** 0473 674 761
E: leah.p@westenv.com.au

From: RobertJohnston@eurofins.com <RobertJohnston@eurofins.com>
Sent: Friday, 4 December 2020 9:40 AM
To: Ruth Allen <ruth.a@westenv.com.au>
Cc: James Gibson <james.g@westenv.com.au>; Leah Petrie <leah.p@westenv.com.au>
Subject: Attention - Eurofins Sample Receipt Advice - Report 761096 : Site 20.227

BH02 15.75 and BH02 19.25 not received

Dear Valued Client,

Please find attached a Sample Receipt Advice (SRA), a Summary Sheet and a scanned copy of your Chain-of-Custody (COC). It is important that you check this documentation to ensure that the details are correct such as the Client Job Number, Turn Around Time, any comments in the Notes section and sample numbers as well as the requested analysis. If there are any irregularities then please contact your Eurofins Analytical Services Manager as soon as possible to make certain that they get changed.

Western Environmental Pty Ltd
Level 3, 25 Prowse Street
West Perth
WA 6005

Attention: **Ruth Allen**

Report **761096-S**
Project name
Project ID 20.227
Received Date Dec 02, 2020

Client Sample ID			**BH02 0.0**	**BH02 0.25**	**BH02 0.5**	**BH02 0.75**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**P20-De07294**	**P20-De07295**	**P20-De07296**	**P20-De07297**
Date Sampled			**Nov 30, 2020**	**Nov 30, 2020**	**Nov 30, 2020**	**Nov 30, 2020**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 40	-	< 20	-
TRH C10-C14	20	mg/kg	< 20	-	< 20	-
TRH C15-C28	50	mg/kg	< 50	-	< 50	-
TRH C29-C36	50	mg/kg	< 50	-	< 50	-
TRH C10-C36 (Total)	50	mg/kg	< 50	-	< 50	-
BTEX						
Benzene	0.1	mg/kg	< 0.2	-	< 0.1	-
Toluene	0.1	mg/kg	< 0.2	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	< 0.2	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	< 0.4	-	< 0.2	-
o-Xylene	0.1	mg/kg	< 0.2	-	< 0.1	-
Xylenes - Total*	0.3	mg/kg	< 0.6	-	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	55	-	81	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 1	-	< 0.5	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	< 50	-
TRH C6-C10	20	mg/kg	< 40	-	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 40	-	< 20	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 1	-	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	1.2	-	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	2.4	-	1.2	-
Acenaphthene	0.5	mg/kg	< 1	-	< 0.5	-
Acenaphthylene	0.5	mg/kg	< 1	-	< 0.5	-
Anthracene	0.5	mg/kg	< 1	-	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 1	-	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	< 1	-	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 1	-	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 1	-	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	< 1	-	< 0.5	-
Chrysene	0.5	mg/kg	< 1	-	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 1	-	< 0.5	-
Fluoranthene	0.5	mg/kg	< 1	-	< 0.5	-
Fluorene	0.5	mg/kg	< 1	-	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 1	-	< 0.5	-

Client Sample ID			BH02 0.0	BH02 0.25	BH02 0.5	BH02 0.75
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De07294	P20-De07295	P20-De07296	P20-De07297
Date Sampled			Nov 30, 2020	Nov 30, 2020	Nov 30, 2020	Nov 30, 2020
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.5	mg/kg	< 1	-	< 0.5	-
Phenanthrene	0.5	mg/kg	< 1	-	< 0.5	-
Pyrene	0.5	mg/kg	< 1	-	< 0.5	-
Total PAH*	0.5	mg/kg	< 1	-	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	73	-	80	-
p-Terphenyl-d14 (surr.)	1	%	68	-	82	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.2	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.1	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.1	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.1	-	< 0.05	-
a-BHC	0.05	mg/kg	< 0.1	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.1	-	< 0.05	-
b-BHC	0.05	mg/kg	< 0.1	-	< 0.05	-
d-BHC	0.05	mg/kg	< 0.1	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.1	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.1	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.1	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.1	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.1	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.1	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.1	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.1	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.1	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.1	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.1	-	< 0.05	-
Methoxychlor	0.05	mg/kg	< 0.1	-	< 0.05	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.1	-	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.1	-	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	-	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	-	< 0.1	-
Dibutylchlorendate (surr.)	1	%	99	-	117	-
Tetrachloro-m-xylene (surr.)	1	%	74	-	57	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	-	< 50	-
TRH >C16-C34	100	mg/kg	< 100	-	< 100	-
TRH >C34-C40	100	mg/kg	< 100	-	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	-	< 100	-
Heavy Metals						
Arsenic	2	mg/kg	< 2	-	< 2	-
Cadmium	0.4	mg/kg	< 0.4	-	< 0.4	-
Chromium	5	mg/kg	6.6	-	< 5	-
Copper	5	mg/kg	5.5	-	11	-
Lead	5	mg/kg	31	-	15	-
Mercury	0.1	mg/kg	< 0.1	-	< 0.1	-
Nickel	5	mg/kg	< 5	-	< 5	-
Zinc	5	mg/kg	49	-	26	-

Client Sample ID			BH02 0.0	BH02 0.25	BH02 0.5	BH02 0.75
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De07294	P20-De07295	P20-De07296	P20-De07297
Date Sampled			Nov 30, 2020	Nov 30, 2020	Nov 30, 2020	Nov 30, 2020
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.4	9.3	9.3	9.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.4	7.1	6.9	7.2
Reaction Ratings*[S05]	-	comment	3.0	3.0	2.0	2.0
% Moisture	1	%	4.2	-	15	-

Client Sample ID			BH02 1.0	BH02 1.25	BH02 1.5	BH02 1.75
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De07298	P20-De07299	P20-De07300	P20-De07301
Date Sampled			Nov 30, 2020	Nov 30, 2020	Nov 30, 2020	Nov 30, 2020
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.7	8.2	8.4	7.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	6.8	6.8	6.9	5.4
Reaction Ratings*[S05]	-	comment	2.0	3.0	3.0	3.0

Client Sample ID			BH02 2.0	BH02 2.25	BH02 2.5	BH02 2.75
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De07302	P20-De07303	P20-De07304	P20-De07305
Date Sampled			Nov 30, 2020	Nov 30, 2020	Nov 30, 2020	Nov 30, 2020
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.9	8.9	8.9	7.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.5	7.2	6.7	2.7
Reaction Ratings*[S05]	-	comment	3.0	3.0	3.0	4.0

Client Sample ID			BH02 3.0	BH02 3.25	BH02 3.5	BH02 3.75
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De07306	P20-De07307	P20-De07308	P20-De07309
Date Sampled			Nov 30, 2020	Nov 30, 2020	Nov 30, 2020	Nov 30, 2020
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.5	8.0	7.7	7.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.6	2.6	2.7	2.7
Reaction Ratings*[S05]	-	comment	2.0	2.0	3.0	3.0

Client Sample ID			BH02 4.0	BH02 4.25	BH02 4.5	BH02 4.75
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De07310	P20-De07311	P20-De07312	P20-De07313
Date Sampled			Nov 30, 2020	Nov 30, 2020	Nov 30, 2020	Nov 30, 2020
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.4	7.4	7.5	8.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.7	2.9	3.1	5.3
Reaction Ratings*[S05]	-	comment	3.0	3.0	2.0	2.0

Client Sample ID			BH02 5.0	BH 5.25	BH02 5.5	BH02 5.75
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De07314	P20-De07315	P20-De07316	P20-De07317
Date Sampled			Nov 30, 2020	Nov 30, 2020	Nov 30, 2020	Nov 30, 2020
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.6	8.0	7.4	7.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.9	3.5	3.0	2.8
Reaction Ratings*[S05]	-	comment	3.0	2.0	2.0	2.0

Client Sample ID			BH02 6.0
Sample Matrix			Soil
Eurofins Sample No.			P20-De07318
Date Sampled			Nov 30, 2020
Test/Reference	LOR	Unit	
Acid Sulfate Soils Field pH Test			
pH-F (Field pH test)*	0.1	pH Units	7.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.7
Reaction Ratings*[S05]	-	comment	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
Eurofins Suite B9			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Perth	Dec 09, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Perth	Dec 09, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Perth	Dec 09, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Perth	Dec 09, 2020	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Organochlorine Pesticides	Perth	Dec 09, 2020	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Perth	Dec 09, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Metals M8	Perth	Dec 09, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters Soils Sediments by ICP-MS			
Acid Sulfate Soils Field pH Test	Perth	Dec 04, 2020	7 Days
- Method: LTM-GEN- 7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests			
% Moisture	Perth	Dec 03, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

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

Company Name: Western Environmental Pty Ltd
Address: Level 3, 25 Prowse Street
West Perth
WA 6005

Project Name:
Project ID: 20.227

Order No.:
Report #: 761096
Phone: 08 6162 8980
Fax:

Received: Dec 2, 2020 5:05 PM
Due: Dec 9, 2020
Priority: 5 Day
Contact Name: Ruth Allen

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Eurofins Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736						X	X	X	X
Mayfield Laboratory									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	BH02 0.0	Nov 30, 2020		Soil	P20-De07294		X	X	X
2	BH02 0.25	Nov 30, 2020		Soil	P20-De07295		X		
3	BH02 0.5	Nov 30, 2020		Soil	P20-De07296		X	X	X
4	BH02 0.75	Nov 30, 2020		Soil	P20-De07297		X		
5	BH02 1.0	Nov 30, 2020		Soil	P20-De07298		X		
6	BH02 1.25	Nov 30, 2020		Soil	P20-De07299		X	X	
7	BH02 1.5	Nov 30, 2020		Soil	P20-De07300		X		
8	BH02 1.75	Nov 30, 2020		Soil	P20-De07301		X		
9	BH02 2.0	Nov 30, 2020		Soil	P20-De07302		X		

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

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

Company Name: Western Environmental Pty Ltd
Address: Level 3, 25 Prowse Street
West Perth
WA 6005

Project Name:
Project ID: 20.227

Order No.:
Report #: 761096
Phone: 08 6162 8980
Fax:

Received: Dec 2, 2020 5:05 PM
Due: Dec 9, 2020
Priority: 5 Day
Contact Name: Ruth Allen

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Eurofins Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736						X	X	X	X
Mayfield Laboratory									
External Laboratory									
10	BH02 2.25	Nov 30, 2020		Soil	P20-De07303		X		
11	BH02 2.5	Nov 30, 2020		Soil	P20-De07304		X		
12	BH02 2.75	Nov 30, 2020		Soil	P20-De07305		X		
13	BH02 3.0	Nov 30, 2020		Soil	P20-De07306		X		
14	BH02 3.25	Nov 30, 2020		Soil	P20-De07307		X		
15	BH02 3.5	Nov 30, 2020		Soil	P20-De07308		X		
16	BH02 3.75	Nov 30, 2020		Soil	P20-De07309		X		
17	BH02 4.0	Nov 30, 2020		Soil	P20-De07310		X		
18	BH02 4.25	Nov 30, 2020		Soil	P20-De07311		X		
19	BH02 4.5	Nov 30, 2020		Soil	P20-De07312		X		
20	BH02 4.75	Nov 30, 2020		Soil	P20-De07313		X		

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

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

Company Name: Western Environmental Pty Ltd
Address: Level 3, 25 Prowse Street
West Perth
WA 6005

Project Name:
Project ID: 20.227

Order No.:
Report #: 761096
Phone: 08 6162 8980
Fax:

Received: Dec 2, 2020 5:05 PM
Due: Dec 9, 2020
Priority: 5 Day
Contact Name: Ruth Allen

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Eurofins Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736						X	X	X	X
Mayfield Laboratory									
External Laboratory									
21	BH02 5.0	Nov 30, 2020		Soil	P20-De07314		X		
22	BH 5.25	Nov 30, 2020		Soil	P20-De07315		X		
23	BH02 5.5	Nov 30, 2020		Soil	P20-De07316		X		
24	BH02 5.75	Nov 30, 2020		Soil	P20-De07317		X		
25	BH02 6.0	Nov 30, 2020		Soil	P20-De07318		X		
26	BH02 6.25	Nov 30, 2020		Soil	P20-De07319	X			
27	BH02 6.5	Nov 30, 2020		Soil	P20-De07320	X			
28	BH02 6.75	Nov 30, 2020		Soil	P20-De07321	X			
29	BH02 7.0	Nov 30, 2020		Soil	P20-De07322	X			
30	BH02 7.25	Nov 30, 2020		Soil	P20-De07323	X			
31	BH02 7.5	Nov 30, 2020		Soil	P20-De07324	X			

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

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

Company Name: Western Environmental Pty Ltd
Address: Level 3, 25 Prowse Street
West Perth
WA 6005

Project Name:
Project ID: 20.227

Order No.:
Report #: 761096
Phone: 08 6162 8980
Fax:

Received: Dec 2, 2020 5:05 PM
Due: Dec 9, 2020
Priority: 5 Day
Contact Name: Ruth Allen

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Eurofins Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736						X	X	X	X
Mayfield Laboratory									
External Laboratory									
32	BH02 7.75	Nov 30, 2020		Soil	P20-De07325	X			
33	BH02 8.0	Nov 30, 2020		Soil	P20-De07326	X			
34	BH02 8.25	Nov 30, 2020		Soil	P20-De07327	X			
35	BH02 8.5	Nov 30, 2020		Soil	P20-De07328	X			
36	BH02 8.75	Nov 30, 2020		Soil	P20-De07329	X			
37	BH02 9.0	Nov 30, 2020		Soil	P20-De07330	X			
38	BH02 9.25	Nov 30, 2020		Soil	P20-De07331	X			
39	BH02 9.5	Nov 30, 2020		Soil	P20-De07332	X			
40	BH02 9.75	Nov 30, 2020		Soil	P20-De07333	X			
41	BH02 10.0	Nov 30, 2020		Soil	P20-De07334	X			
42	BH02 10.25	Nov 30, 2020		Soil	P20-De07335	X			

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

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

Company Name: Western Environmental Pty Ltd
Address: Level 3, 25 Prowse Street
West Perth
WA 6005

Project Name:
Project ID: 20.227

Order No.:
Report #: 761096
Phone: 08 6162 8980
Fax:

Received: Dec 2, 2020 5:05 PM
Due: Dec 9, 2020
Priority: 5 Day
Contact Name: Ruth Allen

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Eurofins Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736						X	X	X	X
Mayfield Laboratory									
External Laboratory									
43	BH02 10.5	Nov 30, 2020		Soil	P20-De07336	X			
44	BH02 10.75	Nov 30, 2020		Soil	P20-De07337	X			
45	BH02 11.0	Nov 30, 2020		Soil	P20-De07338	X			
46	BH02 11.25	Nov 30, 2020		Soil	P20-De07339	X			
47	BH02 11.5	Nov 30, 2020		Soil	P20-De07340	X			
48	BH02 11.75	Nov 30, 2020		Soil	P20-De07341	X			
49	BH02 12.0	Nov 30, 2020		Soil	P20-De07342	X			
50	BH02 12.25	Nov 30, 2020		Soil	P20-De07343	X			
51	BH02 12.5	Nov 30, 2020		Soil	P20-De07344	X			
52	BH02 12.75	Nov 30, 2020		Soil	P20-De07345	X			
53	BH02 13.0	Nov 30, 2020		Soil	P20-De07346	X			

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

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

Company Name: Western Environmental Pty Ltd
Address: Level 3, 25 Prowse Street
West Perth
WA 6005

Project Name:
Project ID: 20.227

Order No.:
Report #: 761096
Phone: 08 6162 8980
Fax:

Received: Dec 2, 2020 5:05 PM
Due: Dec 9, 2020
Priority: 5 Day
Contact Name: Ruth Allen

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Eurofins Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736						X	X	X	X
Mayfield Laboratory									
External Laboratory									
54	BH02 13.25	Nov 30, 2020		Soil	P20-De07347	X			
55	BH02 13.5	Nov 30, 2020		Soil	P20-De07348	X			
56	BH02 13.75	Nov 30, 2020		Soil	P20-De07349	X			
57	BH02 14.0	Nov 30, 2020		Soil	P20-De07350	X			
58	BH02 14.25	Nov 30, 2020		Soil	P20-De07351	X			
59	BH02 14.5	Nov 30, 2020		Soil	P20-De07352	X			
60	BH02 14.75	Nov 30, 2020		Soil	P20-De07353	X			
61	BH02 15.0	Nov 30, 2020		Soil	P20-De07354	X			
62	BH02 15.25	Nov 30, 2020		Soil	P20-De07355	X			
63	BH02 15.5	Nov 30, 2020		Soil	P20-De07356	X			
64	BH02 16.0	Nov 30, 2020		Soil	P20-De07358	X			

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

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

Company Name: Western Environmental Pty Ltd
Address: Level 3, 25 Prowse Street
West Perth
WA 6005

Project Name:
Project ID: 20.227

Order No.:
Report #: 761096
Phone: 08 6162 8980
Fax:

Received: Dec 2, 2020 5:05 PM
Due: Dec 9, 2020
Priority: 5 Day
Contact Name: Ruth Allen

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Eurofins Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736						X	X	X	X
Mayfield Laboratory									
External Laboratory									
65	BH02 16.25	Nov 30, 2020		Soil	P20-De07359	X			
66	BH02 16.5	Nov 30, 2020		Soil	P20-De07360	X			
67	BH02 16.75	Nov 30, 2020		Soil	P20-De07361	X			
68	BH02 17.0	Nov 30, 2020		Soil	P20-De07362	X			
69	BH02 17.25	Nov 30, 2020		Soil	P20-De07363	X			
70	BH02 17.5	Nov 30, 2020		Soil	P20-De07364	X			
71	BH02 17.75	Nov 30, 2020		Soil	P20-De07365	X			
72	BH02 18.0	Nov 30, 2020		Soil	P20-De07366	X			
73	BH02 18.25	Nov 30, 2020		Soil	P20-De07367	X			
74	BH0218.5	Nov 30, 2020		Soil	P20-De07368	X			
75	BH02 18.75	Nov 30, 2020		Soil	P20-De07369	X			

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

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

Company Name: Western Environmental Pty Ltd
Address: Level 3, 25 Prowse Street
West Perth
WA 6005

Project Name:
Project ID: 20.227

Order No.:
Report #: 761096
Phone: 08 6162 8980
Fax:

Received: Dec 2, 2020 5:05 PM
Due: Dec 9, 2020
Priority: 5 Day
Contact Name: Ruth Allen

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Eurofins Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736						X	X	X	X
Mayfield Laboratory									
External Laboratory									
76	BH02 19.0	Nov 30, 2020		Soil	P20-De07370	X			
77	BH02 19.5	Nov 30, 2020		Soil	P20-De07372	X			
78	BH02 19.75	Nov 30, 2020		Soil	P20-De07373	X			
79	BH02 20.0	Nov 30, 2020		Soil	P20-De07374	X			
Test Counts						54	25	3	2

eurofins | Environment Testing

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
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	93			70-130	Pass	
TRH C10-C14	%	75			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	88			70-130	Pass	
Toluene	%	97			70-130	Pass	
Ethylbenzene	%	111			70-130	Pass	
m&p-Xylenes	%	116			70-130	Pass	
Xylenes - Total*	%	117			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	111			70-130	Pass	
TRH C6-C10	%	95			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	72			70-130	Pass	
Acenaphthylene	%	109			70-130	Pass	
Anthracene	%	105			70-130	Pass	
Benz(a)anthracene	%	73			70-130	Pass	
Benzo(a)pyrene	%	91			70-130	Pass	
Benzo(b&j)fluoranthene	%	109			70-130	Pass	
Benzo(g.h.i)perylene	%	102			70-130	Pass	
Benzo(k)fluoranthene	%	100			70-130	Pass	
Chrysene	%	112			70-130	Pass	
Dibenz(a.h)anthracene	%	74			70-130	Pass	
Fluoranthene	%	87			70-130	Pass	
Fluorene	%	73			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	80			70-130	Pass	
Naphthalene	%	74			70-130	Pass	
Phenanthrene	%	89			70-130	Pass	
Pyrene	%	74			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	81			70-130	Pass	
4.4'-DDE	%	75			70-130	Pass	
a-BHC	%	87			70-130	Pass	
b-BHC	%	77			70-130	Pass	
d-BHC	%	93			70-130	Pass	
Endosulfan sulphate	%	82			70-130	Pass	
Endrin	%	75			70-130	Pass	
Endrin ketone	%	114			70-130	Pass	
g-BHC (Lindane)	%	82			70-130	Pass	
Heptachlor	%	105			70-130	Pass	
Heptachlor epoxide	%	79			70-130	Pass	
Methoxychlor	%	105			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	76			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	93			80-120	Pass	
Cadmium	%	94			80-120	Pass	
Chromium	%	92			80-120	Pass	
Copper	%	94			80-120	Pass	
Lead	%	95			80-120	Pass	
Mercury	%	91			80-120	Pass	
Nickel	%	91			80-120	Pass	
Zinc	%	97			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	P20-De15850	NCP	%	115			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	P20-De07891	NCP	%	92			70-130	Pass	
Toluene	P20-De15850	NCP	%	99			70-130	Pass	
Ethylbenzene	P20-De15850	NCP	%	121			70-130	Pass	
m&p-Xylenes	P20-De15850	NCP	%	119			70-130	Pass	
o-Xylene	P20-De15850	NCP	%	111			70-130	Pass	
Xylenes - Total*	P20-De15850	NCP	%	117			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	P20-De07891	NCP	%	105			70-130	Pass	
TRH C6-C10	P20-De07891	NCP	%	125			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	P20-De07038	NCP	%	89			70-130	Pass	
4.4'-DDE	P20-De07038	NCP	%	78			70-130	Pass	
a-BHC	P20-De07038	NCP	%	94			70-130	Pass	
Aldrin	P20-De07038	NCP	%	77			70-130	Pass	
b-BHC	P20-De07038	NCP	%	76			70-130	Pass	
d-BHC	P20-De07038	NCP	%	110			70-130	Pass	
Endosulfan II	P20-De07038	NCP	%	80			70-130	Pass	
Endosulfan sulphate	P20-De07038	NCP	%	85			70-130	Pass	
Endrin	P20-De07038	NCP	%	78			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin ketone	P20-De07038	NCP	%	111			70-130	Pass	
g-BHC (Lindane)	P20-De07038	NCP	%	86			70-130	Pass	
Heptachlor	P20-De07038	NCP	%	122			70-130	Pass	
Heptachlor epoxide	P20-De07038	NCP	%	85			70-130	Pass	
Methoxychlor	P20-De07038	NCP	%	114			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	P20-De06959	NCP	%	78			75-125	Pass	
Cadmium	P20-De06959	NCP	%	87			75-125	Pass	
Chromium	P20-De06959	NCP	%	93			75-125	Pass	
Copper	P20-De06959	NCP	%	102			75-125	Pass	
Lead	P20-De06959	NCP	%	90			75-125	Pass	
Mercury	P20-De06959	NCP	%	86			75-125	Pass	
Nickel	P20-De06959	NCP	%	86			75-125	Pass	
Zinc	P20-De06959	NCP	%	83			75-125	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	P20-De06959	NCP	%	73			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	P20-De07038	NCP	%	83			70-130	Pass	
Acenaphthylene	P20-De07038	NCP	%	123			70-130	Pass	
Anthracene	P20-De07038	NCP	%	117			70-130	Pass	
Benz(a)anthracene	P20-No47851	NCP	%	93			70-130	Pass	
Benzo(a)pyrene	P20-De07038	NCP	%	83			70-130	Pass	
Benzo(b&j)fluoranthene	P20-No47851	NCP	%	94			70-130	Pass	
Benzo(g.h.i)perylene	P20-No47851	NCP	%	123			70-130	Pass	
Benzo(k)fluoranthene	P20-No47851	NCP	%	107			70-130	Pass	
Chrysene	P20-No47851	NCP	%	109			70-130	Pass	
Dibenz(a.h)anthracene	P20-De07038	NCP	%	102			70-130	Pass	
Fluoranthene	P20-De07038	NCP	%	74			70-130	Pass	
Fluorene	P20-De07038	NCP	%	81			70-130	Pass	
Indeno(1.2.3-cd)pyrene	P20-De07038	NCP	%	113			70-130	Pass	
Naphthalene	P20-De07038	NCP	%	85			70-130	Pass	
Phenanthrene	P20-De07038	NCP	%	94			70-130	Pass	
Pyrene	P20-De07038	NCP	%	83			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	P20-De06959	NCP	%	71			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	P20-De15859	NCP	mg/kg	< 4000	< 40	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	P20-De15859	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toluene	P20-De15859	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethylbenzene	P20-De15859	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
m&p-Xylenes	P20-De15859	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
o-Xylene	P20-De15859	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Xylenes - Total*	P20-De15859	NCP	mg/kg	< 0.6	< 0.6	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	P20-De15859	NCP	mg/kg	730	see dil	<1	30%	Pass	
TRH C6-C10	P20-De15859	NCP	mg/kg	< 4000	< 40	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	P20-De06959	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	P20-De06959	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	P20-De06959	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	P20-De06959	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	P20-De06959	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	P20-De06959	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	P20-De06959	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	P20-De06959	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	P20-De06959	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	P20-De06959	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	P20-De06959	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	P20-De06959	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	P20-De06959	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	P20-De06959	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	P20-De06959	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	P20-De06959	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	P20-De06959	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	P20-De06959	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	P20-De06959	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	P20-De06959	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	P20-De07038	NCP	mg/kg	3.5	3.2	10	30%	Pass	
Cadmium	P20-De07038	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	P20-De07038	NCP	mg/kg	10	9.0	11	30%	Pass	
Copper	P20-De07038	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	P20-De07038	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Mercury	P20-De07038	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	P20-De07038	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	P20-De07038	NCP	mg/kg	8.2	7.4	10	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	P20-De07294	CP	pH Units	9.4	9.4	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	P20-De07294	CP	pH Units	7.4	7.3	pass	30%	Pass	
Reaction Ratings*	P20-De07294	CP	comment	3.0	3.0	pass	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	P20-De06959	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	P20-De06959	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	P20-De06959	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	P20-De06959	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	P20-De06959	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	P20-De06959	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	P20-De06959	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	P20-De06959	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	P20-De06959	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	P20-De06959	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	P20-De06959	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	P20-De06959	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	P20-De06959	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	P20-De06959	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	P20-De06959	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Indeno(1.2.3-cd)pyrene	P20-De06959	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	P20-De06959	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	P20-De06959	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	P20-De06959	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	P20-De06959	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	P20-De06959	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	P20-De06959	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	P20-De08562	NCP	%	17	16	6.0	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	P20-De07304	CP	pH Units	8.9	8.8	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	P20-De07304	CP	pH Units	6.7	6.8	pass	30%	Pass	
Reaction Ratings*	P20-De07304	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)*	P20-De07314	CP	pH Units	7.6	7.8	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	P20-De07314	CP	pH Units	2.9	2.9	pass	30%	Pass	
Reaction Ratings*	P20-De07314	CP	comment	3.0	3.0	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
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised By

Rhys Thomas	Analytical Services Manager
Elden Garrett	Senior Analyst-Metal (WA)
Patrick Patfield	Senior Analyst-Organic (WA)
Patrick Patfield	Senior Analyst-Volatile (WA)
Rhys Thomas	Senior Analyst-SPOCAS (WA)

Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

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

CHAIN OF CUSTODY RECORD

WESTERN ENVIRONMENTAL

Company Name : WESTERN ENVIRONMENTAL PTY LTD	Contact Name : Ruth Allen	Purchase Order : 20.227 (per 2020-0345)	CoC Number : 1951
Office Address : Level 3, 25 Prowse Street, West Perth, WA 6005	Project Manager : Ruth Allen	Project Number : 20.227	Quote ID : 190301W
Laboratory Address : mgt-Eurofins, Unit 2, 91 Leach Hwy, Kewdale WA 6105, Contact: Rob Johnston, +61 (0)8 9251 9605, +61 (0)4 2357 9286, Email: Robertjohnston@eurofins.com	Email for results: ruth.a@westenv.com.au	CC 1 & 2: james.g@westenv.com.au leah.p@westenv.com.au	Courier Consignment # :

Special Directions & Comments :

#	Sample ID	Sample Date	Matrix	Analytes: pH Field & Fox	SPOCAS	Suite B9: TRH, BTEXN, PAH, OCP, Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, HG)	HOLD	Container: 1L-Green	250ml Green	Black MB plastic	100ml Red Plastic	100ml Purple Plastic	VIAL	Glass Jar	ASS Soil Bag
1	BH03 0.0	2/12/2020	SOIL	X		X								1	1
2	BH03 0.25		SOIL	X											1
3	BH03 0.5		SOIL	X		X								1	1
4	BH03 0.75		SOIL	X											1
5	BH03 1.0		SOIL	X			X							1	1
6	BH03 1.25		SOIL	X						3:35pm 2/12					1
7	BH03 1.50		SOIL	X			X							1	1
8	BH03 1.75		SOIL	X						21.1 No					1
9	BH03 2.0		SOIL	X			X			21.2				1	1
10	BH03 2.25		SOIL	X						21.1					1
11	BH03 2.5		SOIL	X						-0.2					1
12	BH03 2.75		SOIL	X											1
13	BH03 3.0		SOIL	X											1
14	BH03 3.25		SOIL	X											1
15	BH03 3.5		SOIL	X											1

Final Temp:

Relinquished By: Leah Petrie	Received By: Q. Thomas	Turn around Time : 5 Days	Method Of Shipment :
Date & Time : 3/12/2020	Date & Time : 3:33 pm 3/12	24hrs Field + Fox	Courier x
Signature:	Signature:	Comments : Please provide preliminary report for pH Field & Fox results.	Hand Delivered
	Report Number : 761244		Postal

CHAIN OF CUSTODY RECORD

WESTERN ENVIRONMENTAL

Page 4 of

Company Name : WESTERN ENVIRONMENTAL PTY LTD	Contact Name : Ruth Allen	Purchase Order : 20.227	CoC Number : 1951
Office Address : Level 3, 25 Prowse Street, West Perth, WA 6005	Project Manager : Ruth Allen	Project Number : 20.227	Quote ID : 190301W
Laboratory Address : mgt-Eurofins Unit 2, 91 Leach Hwy Kewdale WA 6105 Contact: Rob Johnston, +61 (0)8 9251 9605, +61 (0)4 2357 9286 Email: Robertjohnston@eurofins.com	Email for results: ruth.a@westenv.com.au	CC: james.g@westenv.com.au leah.p@westenv.com.au	Courier Consignment # :

#	Sample ID	Sample Date	Matrix	Analytes: pH Field & Fox	SPOCAS	Suite B9: TRH, BTEXN, PAH, OCP, Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg)	HOLD	Container: 1L-Green	250ml Green	Black MB plastic	100ml Red Plastic	100ml Purple Plastic	VIAL	Glass Jar	ASS Soil Bag
46	BH04 0.0	2/12/20	SOIL	X		X								1	1
47	BH04 0.25		SOIL	X											1
48	BH04 0.5		SOIL	X		X								1	1
49	BH04 0.75		SOIL	X											1
50	BH04 1.0		SOIL	X			X							1	1
51	BH04 1.25		SOIL	X											1
52	BH04 1.50		SOIL	X			X							1	1
53	BH04 1.75		SOIL	X											1
54	BH04 2.0		SOIL	X			X							1	1
55	BH04 2.25		SOIL	X											1
56	BH04 2.5		SOIL	X											1
57	BH04 2.75		SOIL	X											1
58	BH04 3.0		SOIL	X											1
59	BH04 3.25		SOIL	X											1
60	BH04 3.5		SOIL	X											1

Special Directions & Comments :

Relinquished By:	_Leah Petrie	Received By:	R Thomas
Date & Time :	3/12/2020	Date & Time :	3/12 3:35
Signature:		Signature:	
		Report Number :	761244

Turn around Time :

Comments : Please provide preliminary report for pH Field & Fox results.

Method Of Shipment :

Courier	Yes
Hand Delivered	
Postal	

WESTERN ENVIRONMENTAL

CHAIN OF CUSTODY RECORD

Company Name : WESTERN ENVIRONMENTAL PTY LTD	Contact Name : Ruth Allen	Purchase Order : 20.227	CoC Number : 1951
Office Address : Level 3, 25 Prowse Street, West Perth, WA 6005	Project Manager : Ruth Allen	Project Number : 20.227	Quote ID : 190301W
Laboratory Address : mgt-Eurofins Unit 2, 91 Leach Hwy Kewdale WA 6105 Contact: Rob Johnston, +61 (0)8 9251 9605, +61 (0)4 2357 9286 Email: Robertjohnston@eurofins.com	Email for results: ruth.a@westenv.com.au	CC: james.g@westenv.com.au leah.p@westenv.com.au	Courier Consignment # :

#	Sample ID	Sample Date	Matrix	pH Field & Fox	SPOCAS	Suite B9: TRH, BTEXN, PAH, OCP, Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg)	HOLD	Container: 1L-Green	250ml Green	Black MB plastic	100ml Red Plastic	100ml Purple Plastic	VIAL	Glass Jar	ASS Soil Bag
76	BH03 7.5	2/12/20	SOIL				X								1
77	BH03 7.75	↓	SOIL				X								1
78	BH03 8.0	↓	SOIL				X								1
79															
80															
81															
82															
83															
84															
85															
86															
87															
88															
89															
90															

Special Directions & Comments :

Relinquished By: _Leah Petrie	Received By: R Thomas	Turn around Time :	Method Of Shipment :
Date & Time : 3/12/2020	Date & Time : 3/12 3:33		Courier: Yes
Signature:	Signature:		Hand Delivered:
	Report Number : 71244	Comments : Please provide preliminary report for pH Field & Fox results.	Postal:

Western Environmental Pty Ltd
Level 3, 25 Prowse Street
West Perth
WA 6005

Attention: **Ruth Allen**

Report **761244-S**
Project name
Project ID 20.227
Received Date Dec 02, 2020

Client Sample ID			**BH03 0.0**	**BH03 0.25**	**BH03 0.5**	**BH03 0.75**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**P20-De08623**	**P20-De08624**	**P20-De08625**	**P20-De08626**
Date Sampled			**Nov 30, 2020**	**Nov 30, 2020**	**Nov 30, 2020**	**Nov 30, 2020**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	-	< 20	-
TRH C10-C14	20	mg/kg	< 20	-	< 20	-
TRH C15-C28	50	mg/kg	< 50	-	< 50	-
TRH C29-C36	50	mg/kg	< 50	-	< 50	-
TRH C10-C36 (Total)	50	mg/kg	< 50	-	< 50	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	< 0.1	-
Toluene	0.1	mg/kg	< 0.1	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2	-
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1	-
Xylenes - Total*	0.3	mg/kg	< 0.3	-	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	54	-	78	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	< 0.5	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	< 50	-
TRH C6-C10	20	mg/kg	< 20	-	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	< 20	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	1.2	-
Acenaphthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Acenaphthylene	0.5	mg/kg	< 0.5	-	< 0.5	-
Anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Chrysene	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Fluorene	0.5	mg/kg	< 0.5	-	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-

Client Sample ID			BH03 0.0	BH03 0.25	BH03 0.5	BH03 0.75
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De08623	P20-De08624	P20-De08625	P20-De08626
Date Sampled			Nov 30, 2020	Nov 30, 2020	Nov 30, 2020	Nov 30, 2020
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.5	mg/kg	< 0.5	-	< 0.5	-
Phenanthrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Total PAH*	0.5	mg/kg	< 0.5	-	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	57	-	99	-
p-Terphenyl-d14 (surr.)	1	%	55	-	92	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	-	< 0.1	-
Dibutylchlorendate (surr.)	1	%	89	-	114	-
Tetrachloro-m-xylene (surr.)	1	%	59	-	64	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	-	< 50	-
TRH >C16-C34	100	mg/kg	< 100	-	< 100	-
TRH >C34-C40	100	mg/kg	< 100	-	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	-	< 100	-
Heavy Metals						
Arsenic	2	mg/kg	< 2	-	< 2	-
Cadmium	0.4	mg/kg	< 0.4	-	< 0.4	-
Chromium	5	mg/kg	13	-	< 5	-
Copper	5	mg/kg	< 5	-	< 5	-
Lead	5	mg/kg	16	-	6.9	-
Mercury	0.1	mg/kg	< 0.1	-	< 0.1	-
Nickel	5	mg/kg	< 5	-	< 5	-
Zinc	5	mg/kg	19	-	95	-

Client Sample ID			BH03 0.0	BH03 0.25	BH03 0.5	BH03 0.75
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De08623	P20-De08624	P20-De08625	P20-De08626
Date Sampled			Nov 30, 2020	Nov 30, 2020	Nov 30, 2020	Nov 30, 2020
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.3	9.3	8.9	8.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.4	7.4	7.1	7.1
Reaction Ratings*[S05]	-	comment	3.0	3.0	2.0	2.0
% Moisture	1	%	6.9	-	3.2	-

Client Sample ID			BH03 1.0	BH03 1.25	BH03 1.5	BH03 1.75
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De08627	P20-De08628	P20-De08629	P20-De08630
Date Sampled			Nov 30, 2020	Nov 30, 2020	Nov 30, 2020	Nov 30, 2020
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.0	9.0	8.9	8.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.1	7.4	7.3	7.3
Reaction Ratings*[S05]	-	comment	2.0	2.0	2.0	2.0

Client Sample ID			BH03 2.0	BH03 2.25	BH03 2.5	BH03 2.75
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De08631	P20-De08632	P20-De08633	P20-De08634
Date Sampled			Nov 30, 2020	Nov 30, 2020	Nov 30, 2020	Nov 30, 2020
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.0	7.8	7.6	7.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	6.6	6.5	6.5	6.0
Reaction Ratings*[S05]	-	comment	1.0	1.0	1.0	1.0

Client Sample ID			BH03 3.0	BH03 3.25	BH03 3.5	BH03 3.75
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De08635	P20-De08636	P20-De08637	P20-De08638
Date Sampled			Nov 30, 2020	Nov 30, 2020	Nov 30, 2020	Nov 30, 2020
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.8	7.4	7.4	7.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.8	6.4	5.9	5.6
Reaction Ratings*[S05]	-	comment	2.0	2.0	1.0	1.0

Client Sample ID			BH03 4.0	BH03 4.25	BH03 4.5	BH03 4.75
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De08639	P20-De08640	P20-De08641	P20-De08642
Date Sampled			Nov 30, 2020	Nov 30, 2020	Nov 30, 2020	Nov 30, 2020
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.0	7.0	6.9	7.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.7	5.5	5.5	6.0
Reaction Ratings*[S05]	-	comment	1.0	1.0	1.0	1.0

Client Sample ID			BH03 5.0	BH 5.25	BH03 5.5	BH03 5.75
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De08643	P20-De08644	P20-De08645	P20-De08646
Date Sampled			Nov 30, 2020	Nov 30, 2020	Nov 30, 2020	Nov 30, 2020
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.5	7.0	7.0	7.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	6.0	5.1	5.1	4.7
Reaction Ratings*[S05]	-	comment	2.0	1.0	1.0	2.0

Client Sample ID			BH03 6.0	BH04 0.0	BH04 0.25	BH04 0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De08647	P20-De08656	P20-De08657	P20-De08658
Date Sampled			Nov 30, 2020	Nov 30, 2020	Nov 30, 2020	Nov 30, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	-	< 20
TRH C10-C14	20	mg/kg	-	< 20	-	< 20
TRH C15-C28	50	mg/kg	-	< 50	-	< 50
TRH C29-C36	50	mg/kg	-	< 50	-	< 50
TRH C10-C36 (Total)	50	mg/kg	-	< 50	-	< 50
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	-	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	-	< 0.1	-	< 0.1
Xylenes - Total*	0.3	mg/kg	-	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	132	-	133
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	-	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	-	< 50
TRH C6-C10	20	mg/kg	-	< 20	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	-	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	-	1.2
Acenaphthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Acenaphthylene	0.5	mg/kg	-	< 0.5	-	< 0.5
Anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5

Client Sample ID			BH03 6.0	BH04 0.0	BH04 0.25	BH04 0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De08647	P20-De08656	P20-De08657	P20-De08658
Date Sampled			Nov 30, 2020	Nov 30, 2020	Nov 30, 2020	Nov 30, 2020
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Chrysene	0.5	mg/kg	-	< 0.5	-	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Fluoranthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Fluorene	0.5	mg/kg	-	< 0.5	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Naphthalene	0.5	mg/kg	-	< 0.5	-	< 0.5
Phenanthrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Total PAH*	0.5	mg/kg	-	< 0.5	-	< 0.5
2-Fluorobiphenyl (surr.)	1	%	-	83	-	86
p-Terphenyl-d14 (surr.)	1	%	-	87	-	72
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	< 0.1
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	< 0.05	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	< 0.05
a-BHC	0.05	mg/kg	-	< 0.05	-	< 0.05
Aldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
b-BHC	0.05	mg/kg	-	< 0.05	-	< 0.05
d-BHC	0.05	mg/kg	-	< 0.05	-	< 0.05
Dieldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan I	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan II	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin ketone	0.05	mg/kg	-	< 0.05	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	< 0.05
Methoxychlor	0.05	mg/kg	-	< 0.05	-	< 0.05
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	150	-	130
Tetrachloro-m-xylene (surr.)	1	%	-	53	-	52
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	-	< 50	-	< 50
TRH >C16-C34	100	mg/kg	-	< 100	-	< 100
TRH >C34-C40	100	mg/kg	-	< 100	-	< 100
TRH >C10-C40 (total)*	100	mg/kg	-	< 100	-	< 100

Client Sample ID			BH03 6.0	BH04 0.0	BH04 0.25	BH04 0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De08647	P20-De08656	P20-De08657	P20-De08658
Date Sampled			Nov 30, 2020	Nov 30, 2020	Nov 30, 2020	Nov 30, 2020
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	-	< 2	-	< 2
Cadmium	0.4	mg/kg	-	< 0.4	-	< 0.4
Chromium	5	mg/kg	-	5.8	-	18
Copper	5	mg/kg	-	< 5	-	< 5
Lead	5	mg/kg	-	15	-	8.7
Mercury	0.1	mg/kg	-	< 0.1	-	< 0.1
Nickel	5	mg/kg	-	< 5	-	5.1
Zinc	5	mg/kg	-	16	-	< 5
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.2	9.1	9.4	9.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.5	7.0	7.4	6.9
Reaction Ratings*[S05]	-	comment	2.0	3.0	3.0	3.0
% Moisture	1	%	-	5.3	-	3.9

Client Sample ID			BH04 0.75	BH04 1.0	BH04 1.25	BH04 1.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De08659	P20-De08660	P20-De08661	P20-De08662
Date Sampled			Nov 30, 2020	Nov 30, 2020	Nov 30, 2020	Nov 30, 2020
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.1	8.6	9.0	8.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	6.7	6.0	6.6	6.3
Reaction Ratings*[S05]	-	comment	3.0	2.0	2.0	2.0

Client Sample ID			BH04 1.75	BH04 2.0	BH04 2.25	BH04 2.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De08663	P20-De08664	P20-De08665	P20-De08666
Date Sampled			Nov 30, 2020	Nov 30, 2020	Nov 30, 2020	Nov 30, 2020
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.4	6.3	5.9	5.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.1	2.9	3.4	2.8
Reaction Ratings*[S05]	-	comment	2.0	2.0	2.0	3.0

Client Sample ID			BH04 2.75	BH04 3.0	BH04 3.25	BH04 3.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De08667	P20-De08668	P20-De08669	P20-De08670
Date Sampled			Nov 30, 2020	Nov 30, 2020	Nov 30, 2020	Nov 30, 2020
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.0	5.5	6.5	6.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.7	2.6	3.1	2.6
Reaction Ratings*[S05]	-	comment	4.0	4.0	2.0	2.0

Client Sample ID			BH04 3.75	BH04 4.0	BH04 4.25	BH04 4.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De08671	P20-De08672	P20-De08673	P20-De08674
Date Sampled			Nov 30, 2020	Nov 30, 2020	Nov 30, 2020	Nov 30, 2020
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.1	5.6	5.4	6.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.1	2.5	2.5	2.5
Reaction Ratings*[S05]	-	comment	4.0	2.0	1.0	1.0

Client Sample ID			BH04 4.75	BH04 5.0	BH 5.25	BH04 5.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De08675	P20-De08676	P20-De08677	P20-De08678
Date Sampled			Nov 30, 2020	Nov 30, 2020	Nov 30, 2020	Nov 30, 2020
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.4	6.5	6.7	6.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.9	2.9	3.0	3.0
Reaction Ratings*[S05]	-	comment	2.0	2.0	2.0	2.0

Client Sample ID			BH04 5.75	BH04 6.0
Sample Matrix			Soil	Soil
Eurofins Sample No.			P20-De08679	P20-De08680
Date Sampled			Nov 30, 2020	Nov 30, 2020
Test/Reference	LOR	Unit		
Acid Sulfate Soils Field pH Test				
pH-F (Field pH test)*	0.1	pH Units	5.2	6.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.8	2.9
Reaction Ratings*[S05]	-	comment	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
Eurofins Suite B9			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Perth	Dec 04, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Perth	Dec 04, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Perth	Dec 04, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Perth	Dec 04, 2020	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Organochlorine Pesticides	Perth	Dec 04, 2020	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Perth	Dec 04, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Metals M8	Perth	Dec 04, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters Soils Sediments by ICP-MS			
Acid Sulfate Soils Field pH Test	Perth	Dec 04, 2020	7 Days
- Method: LTM-GEN- 7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests			
% Moisture	Perth	Dec 03, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

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

Company Name: Western Environmental Pty Ltd
Address: Level 3, 25 Prowse Street
West Perth
WA 6005

Project Name:
Project ID: 20.227

Order No.:
Report #: 761244
Phone: 08 6162 8980
Fax:

Received: Dec 2, 2020 5:05 PM
Due: Dec 9, 2020
Priority: 5 Day
Contact Name: Ruth Allen

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Eurofins Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736						X	X	X	X
Mayfield Laboratory									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	BH03 0.0	Nov 30, 2020		Soil	P20-De08623		X	X	X
2	BH03 0.25	Nov 30, 2020		Soil	P20-De08624		X		
3	BH03 0.5	Nov 30, 2020		Soil	P20-De08625		X	X	X
4	BH03 0.75	Nov 30, 2020		Soil	P20-De08626		X		
5	BH03 1.0	Nov 30, 2020		Soil	P20-De08627		X		
6	BH03 1.25	Nov 30, 2020		Soil	P20-De08628		X		
7	BH03 1.5	Nov 30, 2020		Soil	P20-De08629		X		
8	BH03 1.75	Nov 30, 2020		Soil	P20-De08630		X		
9	BH03 2.0	Nov 30, 2020		Soil	P20-De08631		X		

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

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

Company Name: Western Environmental Pty Ltd
Address: Level 3, 25 Prowse Street
West Perth
WA 6005

Project Name:
Project ID: 20.227

Order No.:
Report #: 761244
Phone: 08 6162 8980
Fax:

Received: Dec 2, 2020 5:05 PM
Due: Dec 9, 2020
Priority: 5 Day
Contact Name: Ruth Allen

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Eurofins Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736						X	X	X	X
Mayfield Laboratory									
External Laboratory									
10	BH03 2.25	Nov 30, 2020		Soil	P20-De08632		X		
11	BH03 2.5	Nov 30, 2020		Soil	P20-De08633		X		
12	BH03 2.75	Nov 30, 2020		Soil	P20-De08634		X		
13	BH03 3.0	Nov 30, 2020		Soil	P20-De08635		X		
14	BH03 3.25	Nov 30, 2020		Soil	P20-De08636		X		
15	BH03 3.5	Nov 30, 2020		Soil	P20-De08637		X		
16	BH03 3.75	Nov 30, 2020		Soil	P20-De08638		X		
17	BH03 4.0	Nov 30, 2020		Soil	P20-De08639		X		
18	BH03 4.25	Nov 30, 2020		Soil	P20-De08640		X		
19	BH03 4.5	Nov 30, 2020		Soil	P20-De08641		X		
20	BH03 4.75	Nov 30, 2020		Soil	P20-De08642		X		

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

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

Company Name: Western Environmental Pty Ltd
Address: Level 3, 25 Prowse Street
West Perth
WA 6005

Project Name:
Project ID: 20.227

Order No.:
Report #: 761244
Phone: 08 6162 8980
Fax:

Received: Dec 2, 2020 5:05 PM
Due: Dec 9, 2020
Priority: 5 Day
Contact Name: Ruth Allen

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Eurofins Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736						X	X	X	X
Mayfield Laboratory									
External Laboratory									
21	BH03 5.0	Nov 30, 2020		Soil	P20-De08643		X		
22	BH 5.25	Nov 30, 2020		Soil	P20-De08644		X		
23	BH03 5.5	Nov 30, 2020		Soil	P20-De08645		X		
24	BH03 5.75	Nov 30, 2020		Soil	P20-De08646		X		
25	BH03 6.0	Nov 30, 2020		Soil	P20-De08647		X		
26	BH03 6.25	Nov 30, 2020		Soil	P20-De08648	X			
27	BH03 6.5	Nov 30, 2020		Soil	P20-De08649	X			
28	BH03 6.75	Nov 30, 2020		Soil	P20-De08650	X			
29	BH03 7.0	Nov 30, 2020		Soil	P20-De08651	X			
30	BH03 7.25	Nov 30, 2020		Soil	P20-De08652	X			
31	BH03 7.5	Nov 30, 2020		Soil	P20-De08653	X			

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

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

Company Name: Western Environmental Pty Ltd
Address: Level 3, 25 Prowse Street
West Perth
WA 6005

Project Name:
Project ID: 20.227

Order No.:
Report #: 761244
Phone: 08 6162 8980
Fax:

Received: Dec 2, 2020 5:05 PM
Due: Dec 9, 2020
Priority: 5 Day
Contact Name: Ruth Allen

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Eurofins Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736						X	X	X	X
Mayfield Laboratory									
External Laboratory									
32	BH03 7.75	Nov 30, 2020		Soil	P20-De08654	X			
33	BH03 8.0	Nov 30, 2020		Soil	P20-De08655	X			
34	BH04 0.0	Nov 30, 2020		Soil	P20-De08656		X	X	X
35	BH04 0.25	Nov 30, 2020		Soil	P20-De08657		X		
36	BH04 0.5	Nov 30, 2020		Soil	P20-De08658		X	X	X
37	BH04 0.75	Nov 30, 2020		Soil	P20-De08659		X		
38	BH04 1.0	Nov 30, 2020		Soil	P20-De08660		X		
39	BH04 1.25	Nov 30, 2020		Soil	P20-De08661		X		
40	BH04 1.5	Nov 30, 2020		Soil	P20-De08662		X		
41	BH04 1.75	Nov 30, 2020		Soil	P20-De08663		X		
42	BH04 2.0	Nov 30, 2020		Soil	P20-De08664		X		

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

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

Company Name: Western Environmental Pty Ltd
Address: Level 3, 25 Prowse Street
West Perth
WA 6005

Project Name:
Project ID: 20.227

Order No.:
Report #: 761244
Phone: 08 6162 8980
Fax:

Received: Dec 2, 2020 5:05 PM
Due: Dec 9, 2020
Priority: 5 Day
Contact Name: Ruth Allen

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Eurofins Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736						X	X	X	X
Mayfield Laboratory									
External Laboratory									
43	BH04 2.25	Nov 30, 2020		Soil	P20-De08665		X		
44	BH04 2.5	Nov 30, 2020		Soil	P20-De08666		X		
45	BH04 2.75	Nov 30, 2020		Soil	P20-De08667		X		
46	BH04 3.0	Nov 30, 2020		Soil	P20-De08668		X		
47	BH04 3.25	Nov 30, 2020		Soil	P20-De08669		X		
48	BH04 3.5	Nov 30, 2020		Soil	P20-De08670		X		
49	BH04 3.75	Nov 30, 2020		Soil	P20-De08671		X		
50	BH04 4.0	Nov 30, 2020		Soil	P20-De08672		X		
51	BH04 4.25	Nov 30, 2020		Soil	P20-De08673		X		
52	BH04 4.5	Nov 30, 2020		Soil	P20-De08674		X		
53	BH04 4.75	Nov 30, 2020		Soil	P20-De08675		X		

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

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

Company Name: Western Environmental Pty Ltd
Address: Level 3, 25 Prowse Street
West Perth
WA 6005

Project Name:
Project ID: 20.227

Order No.:
Report #: 761244
Phone: 08 6162 8980
Fax:

Received: Dec 2, 2020 5:05 PM
Due: Dec 9, 2020
Priority: 5 Day
Contact Name: Ruth Allen

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Eurofins Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736						X	X	X	X
Mayfield Laboratory									
External Laboratory									
54	BH04 5.0	Nov 30, 2020		Soil	P20-De08676		X		
55	BH 5.25	Nov 30, 2020		Soil	P20-De08677		X		
56	BH04 5.5	Nov 30, 2020		Soil	P20-De08678		X		
57	BH04 5.75	Nov 30, 2020		Soil	P20-De08679		X		
58	BH04 6.0	Nov 30, 2020		Soil	P20-De08680		X		
59	BH04 6.25	Nov 30, 2020		Soil	P20-De08681	X			
60	BH04 6.5	Nov 30, 2020		Soil	P20-De08682	X			
61	BH04 6.75	Nov 30, 2020		Soil	P20-De08683	X			
62	BH04 7.0	Nov 30, 2020		Soil	P20-De08684	X			
63	BH04 7.25	Nov 30, 2020		Soil	P20-De08685	X			
64	BH04 7.5	Nov 30, 2020		Soil	P20-De08686	X			

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

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

Company Name: Western Environmental Pty Ltd
Address: Level 3, 25 Prowse Street
West Perth
WA 6005

Project Name:
Project ID: 20.227

Order No.:
Report #: 761244
Phone: 08 6162 8980
Fax:

Received: Dec 2, 2020 5:05 PM
Due: Dec 9, 2020
Priority: 5 Day
Contact Name: Ruth Allen

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test	Moisture Set	Eurofins Suite B9
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736						X	X	X	X
Mayfield Laboratory									
External Laboratory									
65	BH04 7.75	Nov 30, 2020		Soil	P20-De08687	X			
66	BH04 8.0	Nov 30, 2020		Soil	P20-De08688	X			
Test Counts						16	50	4	4

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
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	93			80-120	Pass	
Cadmium	%	94			80-120	Pass	
Chromium	%	92			80-120	Pass	
Copper	%	94			80-120	Pass	
Lead	%	95			80-120	Pass	
Mercury	%	91			80-120	Pass	
Nickel	%	91			80-120	Pass	
Zinc	%	97			80-120	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)*	P20-De08623	CP	pH Units	9.3	9.3	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	P20-De08623	CP	pH Units	7.4	7.4	pass	30%	Pass	
Reaction Ratings*	P20-De08623	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)*	P20-De08633	CP	pH Units	7.6	7.6	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	P20-De08633	CP	pH Units	6.5	6.5	pass	30%	Pass	
Reaction Ratings*	P20-De08633	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)*	P20-De08643	CP	pH Units	7.5	7.6	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	P20-De08643	CP	pH Units	6.0	5.9	pass	30%	Pass	
Reaction Ratings*	P20-De08643	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)*	P20-De08663	CP	pH Units	6.4	6.5	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	P20-De08663	CP	pH Units	4.1	3.8	pass	30%	Pass	
Reaction Ratings*	P20-De08663	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)*	P20-De08673	CP	pH Units	5.4	5.5	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	P20-De08673	CP	pH Units	2.5	2.4	pass	30%	Pass	
Reaction Ratings*	P20-De08673	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	No
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised By

Rhys Thomas	Analytical Services Manager
Elden Garrett	Senior Analyst-Metal (WA)
Patrick Patfield	Senior Analyst-Organic (WA)
Patrick Patfield	Senior Analyst-Volatile (WA)
Rhys Thomas	Senior Analyst-SPOCAS (WA)

Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

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

CHAIN OF CUSTODY RECORD

WESTERN ENVIRONMENTAL

Page 1 of 1

Company Name : WESTERN ENVIRONMENTAL PTY LTD	Contact Name : Ruth Allen	Purchase Order : 20.227	CoC Number : 1959
Office Address : Level 3, 25 Prowse Street, West Perth, WA 6005	Project Manager : Ruth Allen	Project Number : 20.227	Quote ID : 190301WES
Laboratory Address : mgt-Eurofins, Unit 2, 91 Leach Hwy, Kewdale WA 6105, Contact: Rob Johnston, +61 (0)8 9251 9605, +61 (0)4 2357 9286, Email: Robertjohnston@eurofins.com	Email for results: ruth.a@westenv.com.au	CC 1 & 2: leah.p@westenv.com.au jordan.wb@westenv.com.au	Courier Consignment # :

Special Directions & Comments : please filter for metals

#	Sample ID	Sample Date	Matrix	BOD	TSS	Oil & Grease	Acidity to pH 6	Alkalinity to pH 10	TKN, Phosphorus	Sulphate as SO4	Conductivity	Metals (Cr, Cu, Pb, Ni, Zn, As, Cd, Mo, Se, Ag, Hg)	pH	R15 suite (including total Al and Fe)	Container: 1L-Green	250ml Green	Black MB plastic	100ml Red Plastic	100ml Purple Plastic	VIAL	Purple Jar	Plastic Bag
1	BH3	9/12/2020	Water	X	X	X	X	X	X	X	X	X	X	X		2		2	1		2	
2	BH4	9/12/2020	Water											X		1		2	1			
3	DUP01	9/12/2020	Water											x		1		2	1			
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						
13																						
14																						
15																						

Date/Time: 4.12.2020 1:21

Chilled: Yes/No

Temp.: 22.6

Correction: 22.4

Final Temp: 22.0

22.13

Relinquished By: Jordan Wood-Bealing	Received By: Dominique Tomlinson	Turn around Time : 3 Days	Method Of Shipment :
Date & Time : 09.12.2020	Date & Time : 9.12.2020 1:21pm	Comments :	Courier
Signature:	Signature:		Hand Delivered: Yes
	Report Number :		Postal

#762532

Western Environmental Pty Ltd
Level 3, 25 Prowse Street
West Perth
WA 6005

Attention: **Ruth Allen**

Report **762532-W-V2**
Project name 20.227
Project ID 20.227
Received Date Dec 09, 2020

Client Sample ID			**BH3**	**BH4**	**DUP01**
Sample Matrix			**Water**	**Water**	**Water**
Eurofins Sample No.			**P20-De20019**	**P20-De20020**	**P20-De20021**
Date Sampled			**Dec 09, 2020**	**Dec 09, 2020**	**Dec 09, 2020**
Test/Reference	LOR	Unit			
Acidity (as CaCO3)	10	mg/L	< 10	< 10	< 10
Ammonia (as N)	0.01	mg/L	0.06	0.10	0.10
Biochemical Oxygen Demand (BOD-5 Day)	5	mg/L	< 5	-	-
Chloride	1	mg/L	190	180	150
Conductivity (at 25°C)	10	uS/cm	710	580	590
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	< 0.05	0.08
Oil & Grease (HEM)	10	mg/L	< 10	-	-
pH (at 25 °C)	0.1	pH Units	7.9	7.4	7.4
Phosphate total (as P)	0.01	mg/L	0.01	< 0.01	< 0.01
Phosphorus filterable reactive (as P)	0.01	mg/L	< 0.01	0.11	< 0.01
Sulphate (as S)	5	mg/L	10	18	16
Total Dissolved Solids Dried at 180°C ± 2°C	10	mg/L	410	320	310
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	< 0.2	< 0.2	< 0.2
Total Nitrogen (as N)*	0.2	mg/L	< 0.2	< 0.2	< 0.2
Total Suspended Solids Dried at 103–105°C	1	mg/L	10	-	-
Alkalinity (speciated)					
Total Alkalinity (as CaCO3)	20	mg/L	73	62	63
Heavy Metals					
Aluminium	0.05	mg/L	0.34	< 0.05	0.10
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.05	< 0.05
Arsenic (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001
Copper	0.001	mg/L	0.002	-	-
Iron	0.05	mg/L	0.12	0.09	0.17
Iron (filtered)	0.05	mg/L	< 0.05	< 0.05	< 0.05
Lead	0.001	mg/L	0.002	-	-
Manganese (filtered)	0.005	mg/L	0.11	0.078	0.082
Mercury	0.0001	mg/L	< 0.0001	-	-
Molybdenum	0.005	mg/L	0.076	-	-
Nickel (filtered)	0.001	mg/L	0.003	0.004	0.004
Selenium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001
Silver	0.005	mg/L	< 0.005	-	-
Zinc (filtered)	0.005	mg/L	0.025	0.016	0.015
Alkali Metals					
Sodium	0.5	mg/L	100	75	79

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
ASS Groundwater Quality Suite - WA Department of Environment and Conservation			
Acidity (as CaCO3)	Perth	Dec 10, 2020	14 Days
- Method: LTM-INO-4210 Acidity			
Ammonia (as N)	Perth	Dec 10, 2020	28 Days
- Method: LTM-INO-4200 Ammonia by Discrete Analyser			
Chloride	Melbourne	Dec 11, 2020	28 Days
- Method: LTM-INO-4090 Chloride by Discrete Analyser			
Conductivity (at 25°C)	Perth	Dec 10, 2020	28 Days
- Method: LTM-INO-4030 Conductivity			
pH (at 25 °C)	Perth	Dec 10, 2020	0 Hours
- Method: LTM-GEN-7090 pH in water by ISE			
Phosphate total (as P)	Melbourne	Dec 11, 2020	28 Days
- Method: LTM-INO-4040 Phosphate by CFA			
Phosphorus filterable reactive (as P)	Melbourne	Dec 11, 2020	2 Days
- Method: APHA 4500-P Phosphate (filterable reactive)			
Sulphate (as S)	Melbourne	Dec 11, 2020	28 Days
- Method: LTM-INO-4110 Sulfate by Discrete Analyser			
Total Dissolved Solids Dried at 180°C ± 2°C	Melbourne	Dec 11, 2020	7 Days
- Method: LTM-INO-4170 Total Dissolved Solids in Water			
Alkalinity (speciated)	Perth	Dec 10, 2020	14 Days
- Method: LTM-INO-4250 Alkalinity by Electrometric Titration			
Heavy Metals	Perth	Dec 16, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Acid Sulphate Metals : Metals M9 filtered	Perth	Dec 10, 2020	180 Days
- Method:			
Alkali Metals	Perth	Dec 10, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Biochemical Oxygen Demand (BOD-5 Day)	Melbourne	Dec 11, 2020	2 Days
- Method: LTM-INO-4010 Biochemical Oxygen Demand (BOD5) in Water			
Oil & Grease (HEM)	Melbourne	Dec 11, 2020	28 Days
- Method: LTM-INO-4180 Oil and Grease (APHA 5520B)			
Total Suspended Solids Dried at 103–105°C	Melbourne	Dec 11, 2020	7 Days
- Method: LTM-INO-4070 Analysis of Suspended Solids in Water by Gravimetry			
Mercury	Perth	Dec 16, 2020	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Total Nitrogen Set (as N)			
Nitrate & Nitrite (as N)	Perth	Dec 10, 2020	28 Days
- Method: LTM-INO-4350 Aqueous Inorganic Analytes by Discrete Analyser			
Total Kjeldahl Nitrogen (as N)	Melbourne	Dec 11, 2020	7 Days
- Method: APHA 4500-Norg B,D Total Kjeldahl Nitrogen by FIA			

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

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

Company Name: Western Environmental Pty Ltd
Address: Level 3, 25 Prowse Street
West Perth
WA 6005

Project Name: 20.227
Project ID: 20.227

Order No.: 20.227
Report #: 762532
Phone: 08 6162 8980
Fax:

Received: Dec 9, 2020 1:21 PM
Due: Dec 14, 2020
Priority: 3 Day
Contact Name: Ruth Allen

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						Biochemical Oxygen Demand (BOD-5 Day)	Oil & Grease (HEM)	Total Suspended Solids Dried at 103–105°C	ASS Groundwater Quality Suite - WA Department of Environment and
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									X
Mayfield Laboratory									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	BH3	Dec 09, 2020		Water	P20-De20019	X	X	X	X
2	BH4	Dec 09, 2020		Water	P20-De20020				X
3	DUP01	Dec 09, 2020		Water	P20-De20021				X
Test Counts						1	1	1	3

eurofins | Environment Testing

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
Method Blank							
Ammonia (as N)	mg/L	< 0.01			0.01	Pass	
Biochemical Oxygen Demand (BOD-5 Day)	mg/L	< 5			5	Pass	
Chloride	mg/L	< 1			1	Pass	
Nitrate & Nitrite (as N)	mg/L	< 0.05			0.05	Pass	
Oil & Grease (HEM)	mg/L	< 10			10	Pass	
Phosphate total (as P)	mg/L	< 0.01			0.01	Pass	
Phosphorus filterable reactive (as P)	mg/L	< 0.01			0.01	Pass	
Sulphate (as S)	mg/L	< 5			5	Pass	
Total Kjeldahl Nitrogen (as N)	mg/L	< 0.2			0.2	Pass	
Total Suspended Solids Dried at 103–105°C	mg/L	< 1			1	Pass	
Method Blank							
Heavy Metals							
Aluminium	mg/L	< 0.05			0.05	Pass	
Aluminium (filtered)	mg/L	< 0.05			0.05	Pass	
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Iron	mg/L	< 0.05			0.05	Pass	
Iron (filtered)	mg/L	< 0.05			0.05	Pass	
Manganese (filtered)	mg/L	< 0.005			0.005	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Selenium (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
Method Blank							
Alkali Metals							
Sodium	mg/L	< 0.5			0.5	Pass	
LCS - % Recovery							
Ammonia (as N)	%	102			70-130	Pass	
Biochemical Oxygen Demand (BOD-5 Day)	%	104			70-130	Pass	
Chloride	%	122			70-130	Pass	
Nitrate & Nitrite (as N)	%	106			70-130	Pass	
Oil & Grease (HEM)	%	76			70-130	Pass	
Phosphate total (as P)	%	87			70-130	Pass	
Sulphate (as S)	%	81			70-130	Pass	
Total Kjeldahl Nitrogen (as N)	%	78			70-130	Pass	
Total Suspended Solids Dried at 103–105°C	%	90			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Aluminium	%	109			80-120	Pass	
Aluminium (filtered)	%	100			80-120	Pass	
Arsenic (filtered)	%	95			80-120	Pass	
Cadmium (filtered)	%	92			80-120	Pass	
Chromium (filtered)	%	99			80-120	Pass	
Iron	%	91			80-120	Pass	
Iron (filtered)	%	98			80-120	Pass	
Manganese (filtered)	%	98			80-120	Pass	
Nickel (filtered)	%	97			80-120	Pass	
Selenium (filtered)	%	93			80-120	Pass	
Zinc (filtered)	%	96			80-120	Pass	
LCS - % Recovery							
Alkali Metals							
Sodium	%	111			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
				Result 1					
Nitrate & Nitrite (as N)	P20-De20019	CP	%	106			70-130	Pass	
Phosphate total (as P)	M20-De20291	NCP	%	74			70-130	Pass	
Total Kjeldahl Nitrogen (as N)	B20-De15577	NCP	%	77			70-130	Pass	
Total Suspended Solids Dried at 103–105°C	S20-De14132	NCP	%	93			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Aluminium	P20-De08596	NCP	%	105			75-125	Pass	
Iron	P20-De08596	NCP	%	91			75-125	Pass	
Spike - % Recovery									
Alkali Metals				Result 1					
Sodium	P20-De05428	NCP	%	101			75-125	Pass	
Spike - % Recovery									
				Result 1					
Ammonia (as N)	P20-De20020	CP	%	104			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Aluminium (filtered)	P20-De20020	CP	%	108			75-125	Pass	
Arsenic (filtered)	P20-De20020	CP	%	101			75-125	Pass	
Cadmium (filtered)	P20-De20020	CP	%	97			75-125	Pass	
Chromium (filtered)	P20-De20020	CP	%	104			75-125	Pass	
Iron (filtered)	P20-De20020	CP	%	89			75-125	Pass	
Manganese (filtered)	P20-De20020	CP	%	91			75-125	Pass	
Nickel (filtered)	P20-De20020	CP	%	99			75-125	Pass	
Selenium (filtered)	P20-De20020	CP	%	105			75-125	Pass	
Zinc (filtered)	P20-De20020	CP	%	102			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
				Result 1	Result 2	RPD			
Ammonia (as N)	P20-De20019	CP	mg/L	0.06	0.06	4.0	30%	Pass	
Biochemical Oxygen Demand (BOD-5 Day)	M20-De20270	NCP	mg/L	< 5	< 5	<1	30%	Pass	
Chloride	P20-De20019	CP	mg/L	190	160	17	30%	Pass	
Nitrate & Nitrite (as N)	P20-De20019	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Oil & Grease (HEM)	S20-De10550	NCP	mg/L	< 10	< 10	<1	30%	Pass	
Phosphate total (as P)	M20-De20301	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Sulphate (as S)	P20-De20019	CP	mg/L	10	8.4	21	30%	Pass	
Total Dissolved Solids Dried at 180°C ± 2°C	M20-De17373	NCP	mg/L	60	61	1.7	30%	Pass	
Total Kjeldahl Nitrogen (as N)	S20-De15839	NCP	mg/L	0.5	0.8	43	30%	Fail	Q15
Total Suspended Solids Dried at 103–105°C	M20-De19910	NCP	mg/L	4.0	41	26	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Aluminium	P20-De08595	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Aluminium (filtered)	P20-De20019	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Arsenic (filtered)	P20-De20019	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium (filtered)	P20-De20019	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	P20-De20019	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Iron	P20-De08595	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Iron (filtered)	P20-De20019	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Manganese (filtered)	P20-De20019	CP	mg/L	0.11	0.11	1.0	30%	Pass	
Nickel (filtered)	P20-De20019	CP	mg/L	0.003	0.003	1.0	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Selenium (filtered)	P20-De20019	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc (filtered)	P20-De20019	CP	mg/L	0.025	0.029	15	30%	Pass	
Duplicate									
Alkali Metals				Result 1	Result 2	RPD			
Sodium	P20-De08595	NCP	mg/L	55	54	1.0	30%	Pass	

Comments

V2 report issued with additional metals results as per CoC.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	No
Appropriate sample containers have been used	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.

Authorised By

Rhys Thomas	Analytical Services Manager
Elden Garrett	Senior Analyst-Metal (WA)
Rhys Thomas	Senior Analyst-Inorganic (WA)
Scott Beddoes	Senior Analyst-Inorganic (VIC)

Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

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

Robert Johnston

From: Robert Johnston
Sent: Thursday, 10 December 2020 12:23
To: #AU06_EnviroSampleWA
Subject: 3 DAY: Eurofins Test Results - Report 761244 : Site 20.227

ADDITIONAL ANALYSIS – 3 DAY TAT

Caitlyn Gibson
Eurofins # 762781

From: Leah Petrie <leah.p@westenv.com.au>
Sent: Thursday, 10 December 2020 11:33
To: Robert Johnston <RobertJohnston@eurofins.com>
Cc: Ruth Allen <ruth.a@westenv.com.au>
Subject: RE: Eurofins Test Results - Report 761244 : Site 20.227

EXTERNAL EMAIL*

Thanks Rob,

Please resubmit the following for SPOCAS on a 3 day TAT. Thank you.

BH03 0.25	P20-De08624
BH03 1.0	P20-De08627
BH03 6.0	P20-De08647
BH04 0.5	P20-De08658
BH04 2.0	P20-De08664
BH04 3.0	P20-De08668
BH04 4.75	P20-De08675
BH04 5.75	P20-De08679

Kind regards,

Leah Petrie

Environmental Scientist
BSc Environmental Science and Conservation Biology

Level 3/25 Prowse St, West Perth WA 6005
P: (08) 6162 8980 **M:** 0473 674 761
E: leah.p@westenv.com.au

Western Environmental Pty Ltd
Level 3, 25 Prowse Street
West Perth
WA 6005

Attention: **Leah Petrie**

Report **762781-S**
Project name
Project ID 20.227
Received Date Dec 10, 2020

Client Sample ID			**BH03_0.25**	**BH03_1.0**	**BH03_6.0**	**BH04_0.5**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**P20-De21869**	**P20-De21870**	**P20-De21871**	**P20-De21872**
Date Sampled			**Nov 30, 2020**	**Nov 30, 2020**	**Nov 30, 2020**	**Nov 30, 2020**
Test/Reference	LOR	Unit				
SPOCAS Suite (Minus ANC- WA)						
pH-KCL	0.1	pH Units	9.1	9.1	5.9	9.1
pH-OX	0.1	pH Units	7.7	7.2	5.3	7.5
Acid trail - Titratable Actual Acidity	2	mol H+/t	< 2	< 2	< 2	< 2
Acid trail - Titratable Peroxide Acidity	2	mol H+/t	< 2	< 2	< 2	< 2
Acid trail - Titratable Sulfidic Acidity	2	mol H+/t	< 2	< 2	< 2	< 2
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	< 0.003	< 0.003	< 0.003	< 0.003
sulfidic - TPA equiv. S% pyrite	0.02	% pyrite S	< 0.02	< 0.02	< 0.02	< 0.02
sulfidic - TSA equiv. S% pyrite	0.02	% pyrite S	< 0.02	< 0.02	< 0.02	< 0.02
Sulfur - KCl Extractable	0.02	% S	< 0.02	< 0.02	< 0.02	< 0.02
Sulfur - Peroxide	0.02	% S	< 0.02	< 0.02	< 0.02	< 0.02
Sulfur - Peroxide Oxidisable Sulfur	0.02	% S	< 0.02	< 0.02	< 0.02	< 0.02
acidity - Peroxide Oxidisable Sulfur	10	mol H+/t	< 10	< 10	< 10	< 10
HCl Extractable Sulfur Correction Factor	1	factor	2.0	2.0	2.0	2.0
HCl Extractable Sulfur	0.02	% S	n/a	n/a	n/a	n/a
Net Acid soluble sulfur	0.02	% S	n/a	n/a	n/a	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	n/a	n/a	n/a
Net Acid soluble sulfur - equivalent S% pyrite[S02]	0.02	% S	n/a	n/a	n/a	n/a
Calcium - KCl Extractable	0.02	% Ca	0.18	0.11	< 0.02	0.12
Calcium - Peroxide	0.02	% Ca	2.4	0.14	< 0.02	0.27
Acid Reacted Calcium	0.02	% Ca	2.2	0.03	< 0.02	0.15
acidity - Acid Reacted Calcium	10	mol H+/t	1100	16	< 10	75
sulfidic - Acid Reacted Ca equiv. S% pyrite	0.02	% S	1.8	0.03	< 0.02	0.12
Magnesium - KCl Extractable	0.02	% Mg	< 0.02	< 0.02	< 0.02	< 0.02
Magnesium - Peroxide	0.02	% Mg	0.05	< 0.02	< 0.02	< 0.02
Acid Reacted Magnesium	0.02	% Mg	0.05	< 0.02	< 0.02	< 0.02
acidity - Acid Reacted Magnesium	10	mol H+/t	38	< 10	< 10	< 10
sulfidic - Acid Reacted Mg equiv. S% pyrite	0.02	% S	0.06	< 0.02	< 0.02	< 0.02
Acid Neutralising Capacity (ANCE)	0.02	% CaCO3	5.8	0.31	n/a	0.58
Acid Neutralising Capacity - Acidity units (a-ANCE)	10	mol H+/t	1200	62	n/a	120
Acid Neutralising Capacity - equivalent S% pyrite(s-ANCE)	0.02	% S	1.9	0.10	n/a	0.18
ANC Fineness Factor		factor	1.5	1.5	1.5	1.5
SPOCAS - Net Acidity (Sulfur Units)	0.02	% S	< 0.02	< 0.02	< 0.02	< 0.02
SPOCAS - Net Acidity (Acidity Units)	10	mol H+/t	< 10	< 10	< 10	< 10
SPOCAS - Liming rate	1	kg CaCO3/t	< 1	< 1	< 1	< 1
SPOCAS WA (- ANC) - Net Acidity (S% pyrite units)	0.02	% S	< 0.02	< 0.02	< 0.02	< 0.02

Client Sample ID			BH03_0.25	BH03_1.0	BH03_6.0	BH04_0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De21869	P20-De21870	P20-De21871	P20-De21872
Date Sampled			Nov 30, 2020	Nov 30, 2020	Nov 30, 2020	Nov 30, 2020
Test/Reference	LOR	Unit				
SPOCAS Suite (Minus ANC- WA)						
SPOCAS WA (- ANC) - Net Acidity (Acidity Units)	2	mol H+/t	8.0	< 2	< 2	< 2
SPOCAS WA (- ANC) - Liming rate	1	kg CaCO3/t	1.0	< 1	< 1	< 1
Extraneous Material						
<2mm Fraction	0.005	g	30	38	62	36
>2mm Fraction	0.005	g	7.4	< 0.005	< 0.005	< 0.005
Analysed Material	0.1	%	80	100	100	100
Extraneous Material	0.1	%	20	< 0.1	< 0.1	< 0.1
% Moisture	1	%	7.0	2.7	17	2.6

Client Sample ID			BH04_2.0	BH04_3.0	BH04_4.75	BH04_5.75
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De21873	P20-De21874	P20-De21875	P20-De21876
Date Sampled			Nov 30, 2020	Nov 30, 2020	Nov 30, 2020	Nov 30, 2020
Test/Reference	LOR	Unit				
SPOCAS Suite (Minus ANC- WA)						
pH-KCL	0.1	pH Units	5.7	5.0	5.6	5.5
pH-OX	0.1	pH Units	4.3	2.7	4.0	3.7
Acid trail - Titratable Actual Acidity	2	mol H+/t	4.0	10	2.0	4.0
Acid trail - Titratable Peroxide Acidity	2	mol H+/t	< 2	84	8.0	13
Acid trail - Titratable Sulfidic Acidity	2	mol H+/t	< 2	73	6.0	9.0
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	0.010	0.020	< 0.003	0.010
sulfidic - TPA equiv. S% pyrite	0.02	% pyrite S	< 0.02	0.13	< 0.02	0.02
sulfidic - TSA equiv. S% pyrite	0.02	% pyrite S	< 0.02	0.12	< 0.02	< 0.02
Sulfur - KCl Extractable	0.02	% S	< 0.02	< 0.02	< 0.02	< 0.02
Sulfur - Peroxide	0.02	% S	< 0.02	0.14	< 0.02	0.02
Sulfur - Peroxide Oxidisable Sulfur	0.02	% S	< 0.02	0.12	< 0.02	< 0.02
acidity - Peroxide Oxidisable Sulfur	10	mol H+/t	< 10	77	< 10	12
HCl Extractable Sulfur Correction Factor	1	factor	2.0	2.0	2.0	2.0
HCl Extractable Sulfur	0.02	% S	n/a	n/a	n/a	n/a
Net Acid soluble sulfur	0.02	% S	n/a	n/a	n/a	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	n/a	n/a	n/a
Net Acid soluble sulfur - equivalent S% pyrite[S02]	0.02	% S	n/a	n/a	n/a	n/a
Calcium - KCl Extractable	0.02	% Ca	< 0.02	< 0.02	< 0.02	< 0.02
Calcium - Peroxide	0.02	% Ca	0.02	< 0.02	< 0.02	< 0.02
Acid Reacted Calcium	0.02	% Ca	< 0.02	< 0.02	< 0.02	< 0.02
acidity - Acid Reacted Calcium	10	mol H+/t	< 10	< 10	< 10	< 10
sulfidic - Acid Reacted Ca equiv. S% pyrite	0.02	% S	< 0.02	< 0.02	< 0.02	< 0.02
Magnesium - KCl Extractable	0.02	% Mg	< 0.02	< 0.02	< 0.02	< 0.02
Magnesium - Peroxide	0.02	% Mg	< 0.02	< 0.02	< 0.02	< 0.02
Acid Reacted Magnesium	0.02	% Mg	< 0.02	< 0.02	< 0.02	< 0.02
acidity - Acid Reacted Magnesium	10	mol H+/t	< 10	< 10	< 10	< 10
sulfidic - Acid Reacted Mg equiv. S% pyrite	0.02	% S	< 0.02	< 0.02	< 0.02	< 0.02
Acid Neutralising Capacity (ANCE)	0.02	% CaCO3	n/a	n/a	n/a	n/a
Acid Neutralising Capacity - Acidity units (a-ANCE)	10	mol H+/t	n/a	n/a	n/a	n/a
Acid Neutralising Capacity - equivalent S% pyrite(s-ANCE)	0.02	% S	n/a	n/a	n/a	n/a
ANC Fineness Factor		factor	1.5	1.5	1.5	1.5

Client Sample ID			BH04_2.0	BH04_3.0	BH04_4.75	BH04_5.75
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			P20-De21873	P20-De21874	P20-De21875	P20-De21876
Date Sampled			Nov 30, 2020	Nov 30, 2020	Nov 30, 2020	Nov 30, 2020
Test/Reference	LOR	Unit				
SPOCAS Suite (Minus ANC- WA)						
SPOCAS - Net Acidity (Sulfur Units)	0.02	% S	< 0.02	0.14	< 0.02	0.03
SPOCAS - Net Acidity (Acidity Units)	10	mol H+/t	11	88	< 10	16
SPOCAS - Liming rate	1	kg CaCO3/t	1.0	7.0	1.0	1.0
SPOCAS WA (- ANC) - Net Acidity (S% pyrite units)	0.02	% S	0.02	0.14	0.02	0.03
SPOCAS WA (- ANC) - Net Acidity (Acidity Units)	2	mol H+/t	11	88	9.5	16
SPOCAS WA (- ANC) - Liming rate	1	kg CaCO3/t	1.0	7.0	1.0	1.0
Extraneous Material						
<2mm Fraction	0.005	g	47	52	45	46
>2mm Fraction	0.005	g	< 0.005	< 0.005	< 0.005	< 0.005
Analysed Material	0.1	%	100	100	100	100
Extraneous Material	0.1	%	< 0.1	< 0.1	< 0.1	< 0.1
% Moisture	1	%	13	13	16	15

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
SPOCAS Suite (Minus ANC- WA)			
SPOCAS Suite (Minus ANC- WA)	Brisbane	Dec 14, 2020	6 Week
- Method: LTM-GEN-7050			
Extraneous Material	Brisbane	Dec 10, 2020	6 Week
- Method: LTM-GEN-7050/7070			
% Moisture	Perth	Dec 10, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

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

Company Name: Western Environmental Pty Ltd
Address: Level 3, 25 Prowse Street
West Perth
WA 6005

Project Name:
Project ID: 20.227

Order No.: 20.227
Report #: 762781
Phone: 08 6162 8980
Fax:

Received: Dec 10, 2020 11:33 AM
Due: Dec 15, 2020
Priority: 3 Day
Contact Name: Leah Petrie

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						SPOCAS Suite (Minus ANC- WA)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794						X	
Perth Laboratory - NATA Site # 23736							X
Mayfield Laboratory							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	BH03_0.25	Nov 30, 2020		Soil	P20-De21869	X	X
2	BH03_1.0	Nov 30, 2020		Soil	P20-De21870	X	X
3	BH03_6.0	Nov 30, 2020		Soil	P20-De21871	X	X
4	BH04_0.5	Nov 30, 2020		Soil	P20-De21872	X	X
5	BH04_2.0	Nov 30, 2020		Soil	P20-De21873	X	X
6	BH04_3.0	Nov 30, 2020		Soil	P20-De21874	X	X
7	BH04_4.75	Nov 30, 2020		Soil	P20-De21875	X	X
8	BH04_5.75	Nov 30, 2020		Soil	P20-De21876	X	X
Test Counts						8	8

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									
SPOCAS Suite (Minus ANC- WA)									
pH-KCL			%	98			80-120	Pass	
Acid trail - Titratable Actual Acidity			%	103			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
SPOCAS Suite (Minus ANC- WA)				Result 1	Result 2	RPD			
pH-KCL	P20-De21869	CP	pH Units	9.1	9.2	<1	30%	Pass	
pH-OX	P20-De21869	CP	pH Units	7.7	7.7	<1	30%	Pass	
Acid trail - Titratable Actual Acidity	P20-De21869	CP	mol H+/t	< 2	< 2	<1	30%	Pass	
Acid trail - Titratable Peroxide Acidity	P20-De21869	CP	mol H+/t	< 2	< 2	<1	30%	Pass	
Acid trail - Titratable Sulfidic Acidity	P20-De21869	CP	mol H+/t	< 2	< 2	<1	30%	Pass	
sulfidic - TAA equiv. S% pyrite	P20-De21869	CP	% pyrite S	< 0.003	< 0.003	<1	30%	Pass	
sulfidic - TPA equiv. S% pyrite	P20-De21869	CP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
sulfidic - TSA equiv. S% pyrite	P20-De21869	CP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - KCl Extractable	P20-De21869	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - Peroxide	P20-De21869	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - Peroxide Oxidisable Sulfur	P20-De21869	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
acidity - Peroxide Oxidisable Sulfur	P20-De21869	CP	mol H+/t	< 10	< 10	<1	30%	Pass	
HCl Extractable Sulfur	P20-De21869	CP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur	P20-De21869	CP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - acidity units	P20-De21869	CP	mol H+/t	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	P20-De21869	CP	% S	n/a	n/a	n/a	30%	Pass	
Calcium - KCl Extractable	P20-De21869	CP	% Ca	0.18	0.18	1.0	30%	Pass	
Calcium - Peroxide	P20-De21869	CP	% Ca	2.4	2.4	<1	30%	Pass	
Acid Reacted Calcium	P20-De21869	CP	% Ca	2.2	2.2	<1	30%	Pass	
acidity - Acid Reacted Calcium	P20-De21869	CP	mol H+/t	1100	1100	<1	30%	Pass	
sulfidic - Acid Reacted Ca equiv. S% pyrite	P20-De21869	CP	% S	1.8	1.8	<1	30%	Pass	
Magnesium - KCl Extractable	P20-De21869	CP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
Magnesium - Peroxide	P20-De21869	CP	% Mg	0.05	0.05	1.0	30%	Pass	
Acid Reacted Magnesium	P20-De21869	CP	% Mg	0.05	0.05	1.0	30%	Pass	
acidity - Acid Reacted Magnesium	P20-De21869	CP	mol H+/t	38	37	1.0	30%	Pass	
sulfidic - Acid Reacted Mg equiv. S% pyrite	P20-De21869	CP	% S	0.06	0.06	1.0	30%	Pass	
Acid Neutralising Capacity (ANCE)	P20-De21869	CP	% CaCO3	5.8	5.8	<1	30%	Pass	
Acid Neutralising Capacity - Acidity units (a-ANCE)	P20-De21869	CP	mol H+/t	1200	1200	<1	30%	Pass	
ANC Fineness Factor	P20-De21869	CP	factor	1.5	1.5	<1	30%	Pass	
SPOCAS - Liming rate	P20-De21869	CP	kg CaCO3/t	< 1	< 1	<1	30%	Pass	
SPOCAS WA (- ANC) - Net Acidity (S% pyrite units)	P20-De21869	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
SPOCAS WA (- ANC) - Net Acidity (Acidity Units)	P20-De21869	CP	mol H+/t	8.0	7.6	4.0	30%	Pass	
SPOCAS WA (- ANC) - Liming rate	P20-De21869	CP	kg CaCO3/t	1.0	1.0	4.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	P20-De21874	CP	%	13	14	6.0	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5

Authorised By

Rhys Thomas	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.

Appendix E
Groundwater Field Monitoring Logs

GROUNDWATER SAMPLING RECORD

Location ID:	BH03
Date:	9.12
Project No:	20-227.
Project Title:	88 Mill Point Rd.
Sampling Device:	YSI, pH, peri., Dipper
Field Scientist:	JWB-

Well Information	
Start/Finish time:	
Stickup of ..... mm Casing (m):	
Total well depth (mTOC):	8.68
Depth to water (mTOC):	2.44
Depth to water (mBGL):	
Depth of Slotted interval (mTOC):	
Depth of Extraction (mTOC)*:	
Well Survey (TOC AHD)	
Groundwater Flow Direction:	

Time/Duration (mins)	Depth to Water (TOC)	Purge Vol (L)	Rate (L/min)	pH	EC (Sp) (µS/cm)	TDS (mg/L)	ORP (mV)	DO %	Temp (°C)	Sal (ppt)	TTA	TTalk	Comment
Stablisation Criteria	Δ < -0.1m	-	<1L/min	±0.1	±5%	-	±10 mV	±10%	±0.5	-	-	-	
Alternate Criteria													
4 0	2.44		<1L/min	8.60	973		-48.6	48.6	23.5				
7 3	"		"	8.25	785		-41.8	36.4	22.7				
0 6	"		"	7.86	761		-31.9	33.6	22.6				
3 9	"		"	7.84	760		-32.1	32.9	22.5		10	14	
6 12	"		"	7.78	760		-35.7	30.2	22.4				

Observations: weather, well/location condition, Safety Hazards	Sunny, warm
Water quality: sample, colour, turbidity, odour, sheen	Clear, slightly turbid, no odour, no sheen.
Analysis: analytical suite, dup/trip/QC samples	R15 suite, Discharge to sewage BH3
Notes*	To facilitate lateral ingress during extraction, tubing should be lowered to the mid-point of the slotted interval. In the case that the water level is below the top of the slotted interval, tubing should be lowered to the midpoint between the water level and the bottom of the slotted interval. mTOC: depth in metres from Top of Casing; mBGL: depth in metres Below Ground Level; mAHD: level in terms of Australian Height Datum.

WESTERN ENVIRONMENTAL

GROUNDWATER SAMPLING RECORD

Location ID:	BH4
Date:	9.12.20
Project No:	20.227
Project Title:	88 Mill Point Rd
Sampling Device:	YSI, pH, pe.i, Dipper
Field Scientist:	JWB

Well Information	
Start/Finish time:	
Stickup of ..... mm Casing (m):	
Total well depth (mTOC):	8.79
Depth to water (mTOC):	2.03
Depth to water (mBGL):	
Depth of Slotted interval (mTOC):	
Depth of Extraction (mTOC)*:	
Well Survey (TOC AHD)	
Groundwater Flow Direction:	

Time/Duration (mins)	Depth to Water (TOC)	Purge Vol (L)	Rate (L/min)	pH	EC (Sp) (µS/cm)	TDS (mg/L)	ORP (mV)	DO %	Temp (°C)	Sal (ppt)	TTA	TTalk	Comment
Stablisation Criteria	Δ < -0.1m	-	<1L/min	±0.1	±5%	-	±10 mV	±10%	±0.5	-	-	-	
Alternate Criteria													
0	0	2.03		<1L/min	8.12	621		-25.6	58.6	25.1				
3	3			"	8.01	606		-45.4	48.8	23.5				
6	6			"	8.04	608		-55.3	46.7	23.4				
9	9			"	7.97	617		-61.3	44.3	23.4	22	6		
12	12													

Observations: weather, well/location condition, Safety Hazards	Sunny, hot
Water quality: sample, colour, turbidity, odour, sheen	clear, slightly turbid, no odour.
Analysis: analytical suite, dup/trip/QC samples	R15 Suite BH4, DUP01
Notes*	To facilitate lateral ingress during extraction, tubing should be lowered to the mid-point of the slotted interval. In the case that the water level is below the top of the slotted interval, tubing should be lowered to the midpoint between the water level and the bottom of the slotted interval. mTOC: depth in metres from Top of Casing; mBGL: depth in metres Below Ground Level; mAHD: level in terms of Australian Height Datum.

WESTERN ENVIRONMENTAL