

SH Gosford Residential Pty Ltd

Detailed Site Investigation

Central Coast Quarter, 26 Mann Street, Gosford

20 August 2019



When you
think with a
global mind
problems
get smaller

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Detailed Site Investigation

Prepared for
SH Gosford Residential Pty Ltd

Prepared by
Coffey Services Australia Pty Ltd
Level 19, Tower B, 799 Pacific Highway
Chatswood NSW 2067 Australia
t: +61 2 9406 1119 f: +61 2 9911 1003
ABN: 55 139 460 521

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Important Information About Your Coffey Environmental Report

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Appendix A - Site Survey Plan and Concept Design Drawings

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About This Report

This Detailed Site Investigation Report (DSI) report has been prepared to satisfy the item 17 and part 18 (Acid Sulfate Soil and Groundwater Assessment) of the Secretary's Environmental Assessment Requirements (SEARs). It is understood that this report will be submitted for Concept State Significant Development Application (SSDA) for the Central Coast Quarter development located at 26 Mann St, Gosford. It should be noted this concept SSDA does not cover construction activities and no construction work is currently proposed. Construction related works will be separately addressed at detailed Development Application (DA) stage as appropriate.

This DSI Report has been prepared to assess the presence of land contamination at the site and the suitability of the site for the proposed mixed use residential and commercial development, with respect to land contamination and as such the recommendations of this report should be considered at relevant DA stage.

With considerations under SEPP 55 and based on the results of our assessment and subject to the adoption of the report recommendations of this report, the site could be made suitable for the proposed mixed use residential and commercial development.

Executive Summary

Coffey Services Australia Pty Ltd (Coffey) was commissioned by SH Gosford Residential Pty Ltd to undertake a contamination Detailed Site Investigation (DSI) at 26 Mann Street, Gosford (the 'site').

The objective of the DSI was to assess the presence of land contamination at the site and the suitability of the site for the proposed mixed use residential and commercial development, with respect to land contamination.

Coffey carried out the following scope of work:

- Review of available background information provided by SH Gosford Residential Pty Ltd.
- Field investigation program comprising:
 - soil sampling from nine (9) geotechnical boreholes (BH1 to BH9), eight (8) push tube holes (P1 to P8) and three test pits (TP1 to TP3), five surface sampling points (SS1 to SS5), and two hand auger boreholes (HA1 to HA2)
 - conversion of three (3) geotechnical boreholes into monitoring wells for groundwater and hazardous ground gas monitoring
- Laboratory analytical testing
- Data analysis and reporting

The following potential areas of environmental concern (AECs) associated with land contamination were identified:

- Remnant of hazardous building materials
- Incidental spillage at chemical storage rooms
- Contamination in site fill
- Hazardous ground gas

Our assessment concluded that these AECs do not present an unacceptable health or environmental risk to the intended receptors with respect to the proposed development.

Based on the findings, Coffey considers the site can be made suitable for the proposed mixed use residential/commercial development, subject to the following:

- Offsite disposal of basement excavation will be managed in accordance with waste classification guidelines and regulations. Following removal of the construction equipment and material stored during the DSI, an additional assessment should be carried comprising a visual assessment of the footprints of the construction equipment and material storages, as well as confirmation sampling and laboratory testing of the fill and surface soils to supplement the preliminary waste classification.
- Coffey also recommends implementation of an Unexpected Finds Protocol during excavation and construction, to address potential presence of asbestos (if any) and to mitigate risks associated with new finds of previously undetected contamination.

1. Introduction

1.1. Overview

Coffey Services Australia Pty Ltd (Coffey) was commissioned by SH Gosford Residential Pty to undertake a contamination Detailed Site Investigation (DSI) at 26 Mann Street, Gosford (the 'site').

The work was undertaken concurrently with a geotechnical investigation, in general accordance with Coffey's proposal dated 31 January 2018 (Ref: SYDGE214942-AA). Findings from the geotechnical investigation were documented in a separate Geotechnical Interpretative Report (Ref: SYDGE214942-AB).

This report supersedes the previous iteration (Coffey Ref: SYDGE214942-AC DSI Final, April 2018).

1.2. Proposed Development

Based on the Architectural Plans (AP) prepared by DKO Architecture (Project No. 11725, date 13 August 2019), Coffey understands the development will comprise the following:

- A basement car park with a finished floor level of 1.6m AHD generally covering the entire site
- Three multi-storey residential and commercial structures above the basement

Excavations for the proposed basement car park are expected to extend to depth of up to 7.5m below ground levels (BGL) along the south-eastern boundary adjacent to Mann Street and reducing to grade or less than 0.6m BGL in the central/western portions of the site.

1.3. Objective

The objective of the DSI was to assess the presence of land contamination at the site and the suitability of the site for the proposed mixed use residential and commercial development, with respect to land contamination.

1.4. Scope of Work

Coffey carried out the following scope of work:

- Review of available background information provided by SH Gosford Residential Pty Ltd.
- Field investigation program comprising:
 - soil sampling from nine (9) geotechnical boreholes (BH1 to BH9), eight (8) push tube holes (P1 to P8) and three test pits (TP1 to TP3), five surface sampling points (SS1 to SS5), and two hand auger boreholes (HA1 to HA2)
 - conversion of three (3) geotechnical boreholes into monitoring wells for groundwater and hazardous ground gas monitoring
- Laboratory analytical testing
- Data analysis and reporting

2. Site Description

2.1. Site Identification

General information pertaining to the site is summarised in Table 2.1. A site survey plan is included in Appendix A.

Table 2.1: Site identification

Site address	Part of 26 Mann Street Gosford NSW
Site identification	Lot 1, DP 1235203 Lots 2 to 7, DP14761 Lot 469, DP 821073
Site area	Approximately 8700m ²
Zoning	B4 mixed use under the Gosford Local Environmental Plan (LEP 2014)
Previous land use	Public school (recently demolished)
Current land use	Construction yard comprising temporary offices, car parking and storage area for construction works on the adjoining development
Adjoining land uses	North: newly constructed commercial building (Stage 1 the development) East: construction site to the northeast of the site (Stage 2 the development), Mann Street, and predominately commercial buildings to the east of Mann Street South: Vaughan Avenue and a park to the south of Vaughan Avenue West: Gosford City Park to the west

2.2. Site Features

The following features were observed at the time of the investigation:

- The site is currently used as construction storage area, car parking and site offices for the construction of the adjacent Stage 2 mixed use commercial development to the northeast of the site.
- Topographically, the area surrounding the site slopes down in a westerly direction on to the generally flat alluvial floodplain and reclaimed land surrounding the Brisbane Waters foreshore to the west.

- A concrete crib retaining wall is situated along the eastern boundary with an approximate height of 2m.
- Site surfaces are generally flat with slopes between 1° and 2° within the central and western portion of the site. Site slopes increase up to 7° towards the base of the crib wall within the eastern portion of the site and steepen to approximately 20° from top of wall to the site boundary with Mann Street.
- Site surfacing typically comprises gravel aggregate within the majority of the site.
- Large mature trees were observed within the eastern portion of the site between the crib wall and Mann Street.
- No apparent oil staining or asbestos fragments on ground surface were visible in accessible areas.

A follow-up site visit was undertaken on 7th August 2019 by an experience Coffey Geotechnical Engineer who observed that no appreciable changes to the site had occurred in the period since the initial assessment was undertaken. In addition, no indication of contaminating features such as staining or stockpiled fill materials.

2.3. Soil Landscape

A review of the Office of Environment and Heritage, Electronic Soil Profiling Maps (eSPADE) V2.0 indicates that the majority of the site is situated within disturbed terrain and is known to comprise land reclamation activities of the Brisbane Waters Bay to the west. The eastern portion of the site is situated within the Erina soil landscape which typically comprises undulating to rolling rises and low hills on the Terrigal Formation. The soil profile is expected to comprise brownish-black fine sandy loam topsoil overlying brown sandy clay loam and yellowish-brown sandy clay situated over Terrigal Formation sandstones. These soils are known to be slightly to moderately acidic with pH values of 4.5 to 6.0 and include small angular to sub-angular sandstone rock fragments.

2.4. Geology

Reference to the 1:100,000 Central Coast Coastal Quaternary Geological Map indicates that the eastern portion of the site is generally underlain by Terrigal Formation (Rnt) comprising residual clays overlaying interbedded siltstone, shale and fine to coarse grained quartz-lithic sandstone with minor claystone lenses. The western portion of the site is generally underlain by disturbed terrain and alluvium.

2.5. Acid Sulfate Soil

A review of the Department of Land and Water Conservation, Acid Sulfate Soil Risk Map indicates that the site is situated within disturbed terrain to depths of typically 1m to 2m BGL which is understood to be a resultant from reclamation of the low-lying swamps of the Brisbane Water's foreshore for urban development.

Further review of Council's Acid Sulfate Soils Risk Map indicates that the site is situated within Class 2 Terrain. Class 2 terrain indicates that development consent is required where works are expected to occur below the natural ground surface, or by which the water table is likely to be lowered.

2.6. Hydrogeology

Data obtained from the NSW Office of Water indicates that there are two licensed groundwater bores situated within 500m of the site. Standard water levels were not reported. A summary of the bores are presented in Table 2.2. Given the relatively low-lying landforms and the proximity to Brisbane Water, shallow groundwater subject to tidal influence, likely flowing in a net west to south-westerly direction towards Brisbane Water, is expected in the underlying alluvial profiles.

Table 2.2: Summary of local licensed groundwater bores

Bore ID	Location	Total depth	Approved use
GW201893	100m northwest	78m	Recreation (irrigation of playing fields)
GW201679	150m northwest	102m	Licence cancelled

3. Review of Previous Reports

3.1. Douglas Partners (2014)

Douglas Partners undertook a preliminary site investigation (PSI) at the wider 20 Mann Street site, covering Stages 1, 2 and 3 of the development footprints. The scope included a limited site history review and a preliminary sampling and laboratory analytical program. At the time of the investigation, the PSI investigation area (covering the wider site) was occupied by Gosford Public School, comprising classrooms, offices and amenity buildings, with the remaining areas comprising a mix of concrete or asphalt pavements, gardens or grassed areas. Two chemical storage rooms were identified within the school. Both were reported to comprise security access doors and concrete floor slabs. No spillage incidents were reported.

Historical aerial photographs indicated that the PSI investigation area (covering the wider site) had been occupied by the school prior to 1954 (earliest available aerial photograph).

Douglas Partners (2014) identified the following areas of environmental concern (AEC):

- Low to moderate potential for presence of contamination in areas of filling across the PSI investigation area
- Low to moderate potential for presence of remnants/weathering of hazardous building materials across the majority of the PSI investigation area
- Very low potential for present of contamination due to incidental spillage of stored chemicals (areas not clearly reported by Douglas Partners)
- Low to moderate potential for presence of contamination due to incineration of waste in the north-eastern portion of site (within adjacent development footprint, outside current development footprint, thus not further discussed in this DSI report)

In addition, Douglas Partners identified potential presence of hazardous ground gases in the western/central portions of the PSI investigation area, due to decomposition of organic matter within the alluvial soil profile.

The following information/findings may be relevant to the current development footprint (the site):

- Douglas Partners subsequently undertook a preliminary intrusive and laboratory analytical program comprising 26 borehole locations across the wider PSI investigation area. Of the 26 boreholes, 13 boreholes (Bores 2 to 8, 13, and 22 to 26) were located within the current development footprint.
- From these 13 boreholes, a total of 16 shallow soil (typically top 0.5m) and one surface fibre-cement samples were collected. The majority of the 16 soil samples were analysed for heavy metals, polycyclic aromatic hydrocarbon (PAH), total recoverable hydrocarbons (TRH), BTEX (benzene toluene ethylbenzene xylenes), organochlorine pesticides (OCP), polychlorinated biphenyl (PCB) and asbestos. The fibre-cement sample collected at Bore 26 was analysed for asbestos.
- Concentrations of the analytes were detected below the NEPM low density residential health based investigation levels (HIL-A and HSL-A) adopted by Douglas Partners. Asbestos was not detected in the samples analysed with the exception of one asbestos detection in the fibre-cement sample collected at Bore 26 located at the south-eastern corner.
- Hazardous ground gas monitoring was undertaken at Bores 1, 4, 6, 8, 10, 12 and 23. With the exception of Bores 1, 10 and 12, these monitored Bores were located within the current development footprint. Detectable levels of methane were recorded in Bores 1, 10 (both outside Current development footprint) and 23 (within the Current development footprint), but at concentrations below the screening level of 1.25% adopted by Douglas Partners.

The following conclusions and recommendations were provided by Douglas Partners relevant to the current development footprint (the site):

- Isolated fragments of asbestos have been identified on the ground surface, including Bore 26 located at the south-eastern corner of the Current development footprint. Douglas Partners considered the asbestos fragments were likely associated with demolition of historical building structures at the site, and considered the asbestos impact was not widespread. Douglas Partners recommended an Unexpected Find Protocol be developed to manage the asbestos risks during site clearance and demolition. Following the demolition, the site surface should be reassessed for asbestos contamination.
- Organic materials present within the subsurface are generating methane gas. Douglas Partners recommended that further assessment be carried out to address the potential methane impacts.

Douglas Partners also identified other minor contamination issues. However, these other contamination issues were not relevant to the current development, and hence were not considered further in this DSI report.

Extracts of the Douglas Partners report are included in Appendix B.

4. Preliminary Conceptual Site Model

Based on the above findings, a summary of the identified areas of environmental concern (AEC) and the associated conceptual site model (CSM) is presented in Table 4.1.

Table 4.1: Areas of environmental concern and conceptual site model

AEC	Source & mechanism	Potential chemicals of concern	Media, receptor & pathway (typical)	Likelihood of contamination and pathway completion
Hazardous building materials – entire site	Remnants of demolition of former site structures; impacts typically superficial and localised	Asbestos, lead	Media: near surface soil Receptor: construction and maintenance workers; residential and commercial receptors Pathway: inhalation, direct contact, ingestion	Low likelihood of lead contamination and moderate likelihood of asbestos contamination based on previous PSI With the exception of construction and maintenance workers, pathway is incomplete due to proposed basement excavation and floor slab
Chemical storage rooms – unknown location	Top down spillage of chemicals; impacts typically superficial and localised	Heavy metals, TRH, BTEX	Media: near surface soil Receptor: construction and maintenance workers; residential and commercial receptors and if leachable/migrated, marine aquatic ecosystem and marine recreational receptors Pathway: inhalation, direct contact, ingestion, vertical/lateral migration of leachate/ groundwater	Low likelihood of contamination based on previous results and due to small quantity and presence of floor slab in storage rooms With the exception of construction and maintenance workers, pathway is generally incomplete due to proposed basement excavation and floor slab; however there remains a low likelihood of inhalation of volatiles if concentration is high
Fill – entire site	Top down placement of potentially contaminated fill to level	Heavy metals, TRH, BTEX, PAH,	Media: typically near surface soil; but may potentially impact deeper soil and	Low likelihood of contamination based on previous results

	ground; contamination may be leachable or volatile	OCP, PCB, Asbestos	groundwater if leachable Receptor: construction and maintenance workers; residential and commercial receptors; and if leachable, marine aquatic ecosystem and marine recreational receptors Pathway: inhalation, direct contact, ingestion, vertical/lateral migration of leachate/ groundwater	With the exception of construction and maintenance workers, pathway is generally incomplete due to proposed basement excavation and floor slab; however there remains a low likelihood of inhalation of volatiles if high concentration is present, and a low likelihood of impacts on marine aquatic ecosystem and marine recreational receptors if contamination is leachable
Hazardous ground gases – entire site	Emission and subsurface migration of ground gases due to decomposition of organic matter in soil	Methane, carbon dioxide	Media: ground gas Receptor: construction and maintenance workers; residential and commercial receptors Pathway: explosive, inhalation	Low likelihood of significant concentrations based on previous results Pathway completion is probable if significant concentrations are present

Coffey considers that per- and poly-fluoroalkyl substances (PFAS) contamination is unlikely to be present at the site given firefighting activities using PFAS were not known to have occurred, and the known historic use of the site as a public school are not typically associated with the use, or storage of PFAS.

5. Sampling Analysis and Quality Plan

5.1. Data Quality Objectives

As stated in Section 18 (Appendix B) of Schedule B(2) Guideline on Site Characterisation of the National Environment Protection (Assessment of Site Contamination) Measure (NEPM) as amended (NEPC, 2013) the Data Quality Objective (DQO) process is used to “define the type, quantity and quality of data needed to support decisions relating to the environmental condition of a site”.

The seven-step DQO process adopted for this assessment is provided below.

Step 1: State the Problem

The primary objective of the DSI is to assess the presence of land contamination, and the suitability of the site for the proposed mixed residential/commercial development.

The main problems are:

- How many sampling points are required and where?
- Are there access restrictions present that may affect the location of the preferred sampling points?
- To what depths should the sampling points be extended to?
- At what depth should samples be collected?
- What are the chemicals of potential concern?

Step 2: Identify the Decision

Is the site suitable for the proposed mixed use residential/commercial development, or is remediation required?

Step 3: Identify Inputs to the Decision

The primary inputs to assessing the above include:

- Information provided in previous reports prepared for the site
- Information gathered from site observations
- Results of the investigations
- Relevant guidelines and criteria

Step 4: Define the Study Boundaries

The study boundaries are defined by the site boundaries, as shown on Figure 2.

Vertically, the study boundary is generally defined by the vertical extent of soil contamination, typically base of fill. However, the shallow water bearing zone is also considered for potential groundwater impacts from leaching.

Step 5: Develop a Decision Rule

To assess the suitability of the site, the decision rule for each chemical will be as follows:

- Apparent asbestos and aesthetics impacts are not visible on accessible surface;
- Quality assurance and quality control (QA/QC) assessment indicates that the laboratory data is usable;
- Where contaminant concentrations for each sample are below the adopted investigation levels, then further assessment of the subsurface is not considered necessary to assess the vertical and/or lateral extent of the impact; and
- Where contaminant concentrations are reported to exceed the adopted investigation levels, then statistical analysis (95% UCL), additional investigation, including comparison against Douglas Partners data, may be necessary to further characterise subsurface conditions to assist in planning of remediation works, if required.

In addition, professional judgement will be used based on visual and olfactory observations to supplement the analytical results.

Step 6: Specify Limits of Decision Errors

There are two types of decision errors:

- Sampling errors, which occur when the samples collected are not representative of the conditions within the investigation area; and
- Measurement errors, which occur during sample collection, handling, preparation, analysis and data reduction.

The null hypothesis for this study is:

- Contaminant concentrations are less than the adopted investigation levels.

These errors may lead the decision maker to make the following errors:

- Deciding that the site is not contaminated when the reverse is true; and
- Deciding that the site is contaminated when the reverse is true.

An assessment will be made as to the likelihood of a decision error being made based on the results of a QA/QC assessment and the closeness of the data to assessment criteria. Additionally, statistical methods may be utilised, where applicable, such as 95% upper confidence limit (UCL) calculations.

With respect to visual identification of asbestos, errors may occur due to inaccurate human judgement. Asbestos identification will require suitable competence of staff undertaking fieldwork.

The investigation levels are nominated in the results tables (T1 and T5).

Step 7: Optimise the Design for Obtaining Data

Based on the previous Steps 1 to 6 of the DQO process, the optimal design for obtaining the required data is presented in the following sections (i.e. proposed field and laboratory programs).

5.2. Sampling Plan and Methodology

The adopted sampling plan provided general site coverage and targeted the AECs to assess the presence and/or absence of contamination.

The field investigation program comprised:

- Soil sampling from nine (9) geotechnical boreholes (BH1 to BH9), eight (8) push tube holes (P1 to P8) and three test pits (TP1 to TP3), five surface sampling points (SS1 to SS5), and two hand auger boreholes (HA1 to HA2)
- Conversion of three (3) geotechnical boreholes into monitoring wells for groundwater and hazardous ground gas monitoring

The total number of soil sampling points well exceeded the minimum requirements set out in the Contaminated Sites: Sampling Design Guidelines (NSW EPA, 1995). For a site covering an area of approximately 8,700m², a minimum of 20 sampling locations are required to identify a hotspot with a diameter of 25m with 95% confidence, using a systematic approach. In addition, Douglas Partners data is also available to supplement Coffey's data.

For groundwater and hazardous ground gas monitoring, the three monitoring wells were utilised for initial screening purposes to assess the need for further assessments.

The approximate sampling points are shown on Figure 2.

Soil sampling methodology adopted is summarised in Table 5.1.

Table 5.1: Soil sampling methodology

Activity	Details
Soil sampling	Fieldwork was carried out on 22 February to 19 March 2018, comprising the following: • Undisturbed soil samples were collected using push tube techniques for boreholes BH1 to BH9 and P1 to P8. New disposable push tube liners were used for collection of soil samples. Following soil sampling for DSI purposes, boreholes BH1 to BH9 were further advanced using conventional drilling techniques for geotechnical purposes. Details of the geotechnical drilling methodology are presented in the Geotechnical Interpretative Report (Ref: SYDGE214942-AB). • Test pits were excavated using an excavator for TP1 to TP3. Representative soil samples were collected directly from the centre of the excavator bucket. • Hand auger was utilised to collect shallow soil samples from HA1 to HA2. • Surface bulk samples were collected from SS1 to SS5 using gloved hand, hand tools and a sieve for asbestos analysis. The sampling locations were positioned to provide a general coverage. Representative soil samples were collected from selected intervals, targeting potential near surface impacts associated with fill, hazardous building materials and chemical spillages, if present. Selected deeper soil samples were also collected. The sample collection was conducted in general accordance with relevant Coffey Standard Operating Procedures (SOP) which are based on general industry standards, the NEPM and Australian Standards AS4482.
Soil logging	Soil logging was carried out in general accordance with the Unified Soil Classification System (USCS) by suitably qualified and experienced engineers/scientists. The presence of potential asbestos containing material (ACM), staining or odours was also noted on the borehole and test pit logs (Appendix C).
Soil screening	A portion of each soil sample was placed inside a sealed plastic bag for soil screening in the field for ionisable volatile organic compounds (VOC) using a photo-ionisation detector (PID). The PID was calibrated (or bump tested) at the start of each fieldwork day. Calibration certificates are present in Appendix D. The PID readings, together with field observations, were used to assess which samples should be selected for volatile laboratory analysis. Field screening results are included on the logs presented in Appendix C.

QA/QC samples	To assess the accuracy and precision of the data, Coffey collected a range of QA/QC samples (including duplicates, trip spikes and trip blanks). Details are presented in Appendix F and attached Tables T2, T3, T4.
Sampling handling and transportation	Sample collection, storage and transport were conducted in general accordance with the Coffey relevant SOP. Soil samples were immediately placed into laboratory supplied jars, with Teflon lined seals to limit volatile loss and placed into an ice chilled cooler. The samples were dispatched to NATA accredited laboratories (Eurofins as the primary laboratory and ALS as the secondary laboratory) under chain of custody control.
Decontamination procedures	New disposable push tube liners were used for collection of soil samples from the boreholes and push tube holes. For sampling from test pits, the samples were collected directly from the bucket of the excavator. Therefore, equipment decontamination was not required. For hand auger boreholes, the hand auger was decontaminated between samples with Decon90 solution and rinsed with potable water. A new pair of nitrile gloves was used when handling each soil sample.

Groundwater well installation and groundwater sampling methodology adopted is summarised in Table 5.2

Table 5.2: Groundwater well installation and sampling methodology

Activity	Details
Well installation	Three boreholes BH4 (mid gradient), BH6 (up gradient) and BH7 (down gradient) were converted into monitoring wells (renamed MW1, MW3 and MW2 respectively) on 27 February, 1 March and 2 March 2018. The locations of the monitoring wells were selected to provide a general coverage (Figure 3). The wells were aimed to screen across the observable groundwater table to target the shallow water bearing zone Each well was constructed with machine slotted 50mm Class 18 PVC screen at the base and screw threaded 50mm Class 18 PVC casing extending to the surface. The well annulus was backfilled with graded sand/gravel around the screen and sealed with bentonite above the sand/gravel pack. Each well was finished with flush mounted gatic covers, concreted into the surface of the site. Well construction details are presented in Appendix C. The wells were developed by removing approximately four to six well volumes of water following installation.

Sampling method	Groundwater sampling was carried out on 19 March 2018. Prior to sampling, the standing water level of each monitoring well was measured using an interface probe (IP). A dedicated HydraSleeves sampler was used to collect representative groundwater sample from each well. No purging was required. The HydraSleeves samplers were left in the wells for at least 24 hours prior to sampling. Each sample was field screened using a water quality meter to obtain temperature, pH, redox potential and electrical conductivity (EC) readings.
Decontamination procedure	Dedicated disposable sampling equipment was used. No decontamination of sampling equipment was required.
QA/QC samples	To assess the accuracy and precision of the data, Coffey collected a range of QA/QC samples (including duplicates, trip spikes and trip blanks). Details are presented in Appendix F and attached Tables T6 and T7.
Sampling handling and transportation	Sample collection, storage and transport were conducted in general accordance with the Coffey relevant SOP. Samples were placed in laboratory supplied bottles containing appropriate preservatives with minimal headspace. Samples collected for metals were filtered through 0.45µm filter. Samples containers were immediately capped and placed in a cooler box filled with ice. The samples were dispatched to NATA accredited laboratories under chain of custody condition.

Hazardous ground gas monitoring methodology adopted is summarised in Table 5.3.

Table 5.3: Hazardous ground gas monitoring methodology

Activity	Details
Monitoring method	Hazardous ground gas monitoring was carried out on 19 March 2018 prior to groundwater sampling. The atmospheric pressure was approximately 1010hPa (field data) and falling (based on BOM data) at the time of monitoring. Tide was approximately mid height and rising, at the time of monitoring (in the morning). The three monitoring wells (MW1, MW2 and MW3) were utilised for hazardous ground gas monitoring. Each of the wells was fitted with an Ex-Cap for over 24 hours prior to monitoring. The monitoring was undertaken using a calibrated portable gas analyser (GA5000). Prior to purging and sampling, atmospheric pressure, well flow rate and well internal pressure were recorded.

	During purging, gas readings for methane (CH ₄), carbon dioxide (CO ₂) and oxygen (O ₂) were recorded. After readings have stabilized, a final gas reading for each parameter was recorded.

5.3. Analytical Plan

Laboratory analyses were carried out by NATA accredited laboratories as follows:

- Primary laboratory: Eurofins at Lane Cove West, NSW
- Secondary laboratory: ALS at Smithfield, NSW

A selection of primary soil and groundwater samples was submitted for laboratory analysis for a suite of chemicals of potential concern as summarised in Table 5.4.

Table 5.4: Analytical plan

Analytes	Soil primary samples	Soil leachability samples (TCLP)	Groundwater primary samples
Heavy metals	33	2	3
TRH	32	-	3
BTEX	32	-	3
PAH	33	2	3
OCP	12	-	-
PCB	12	-	-
Asbestos	9 [^]	-	-

[^] Including 4 samples screened for presence/absence (to 0.01%) and 5 bulk (>500mL) samples quantified by gravimetric procedures (AS4964)

In addition to laboratory analysis for DSI purposes, a selection of soil samples were subjected to pH/peroxide screening test for preliminary acid sulfate soils assessment. Selected eight samples were further analysed for presence of acid sulfate soils based on the SPOCAS method.

6. Investigation Levels

6.1. Soil

For assessing contamination levels in soil in urban settings, the amended NEPM (NEPC, 2013) presents health-based investigation levels (HIL) and health screening levels (HSL) for different land uses (e.g. industrial/commercial, residential, recreational, etc).

Based on the proposed use of the site for mixed residential (high density) and commercial purposes, contaminant concentrations, excluding TRH, BTEX and naphthalene, will be assessed against the HIL applicable to high density residential land use (HIL-B) from the NEPM (amended 2013). TRH, BTEX and naphthalene concentrations were assessed against the soil health screening levels (HSL) for vapour intrusion from the relevant depth and soil matrix applicable to low-high density residential land use (HSL A/B) from the NEPM (amended 2013). Based on the expected subsurface conditions, the HSL for sandy soils, 0m to <1m, have been adopted.

Given the proposed basement slab will generally cover the entire site, ecological investigation levels (EIL) and ecological screening levels (ESL) have not been considered.

In accordance with Section 2.9 of NEPM Schedule B1 (NEPC, 2013), consideration of Management Limits has been undertaken to assess whether the reported soil conditions have the potential to pose a potential risk to buried infrastructure, or the formation of non-aqueous phase liquids (NAPL). Based on the proposed site use and the expected subsurface conditions, the Management Limits for coarse grained soil, for residential, parkland and public open space, have been adopted.

With respect to asbestos, qualitative screening testing (presence/absence) was undertaken to assess the potential presence of asbestos in the samples. For the purposes of this DSI, a conservative criterion of “below limit of report (LOR)” has been adopted. Selected surface bulk samples were collected and analysed quantitatively for asbestos. For these samples, asbestos concentrations (fibrous asbestos, asbestos fines) were assessed against the HSL for asbestos contamination in soil presented in the amended NEPM (NEPC, 2013) applicable to “Residential B” land use (HSL-B).

The adopted soil investigation levels are presented in attached Table T1.

6.2. Groundwater

For assessing contamination levels in groundwater in urban settings, the amended NEPM (NEPC, 2013) presents health screening levels (HSL) for different land uses (e.g. industrial/commercial, residential, recreational, etc).

Based on the proposed use of the site for mixed residential (high density) and commercial purposes, TRH, BTEX and naphthalene concentrations were assessed against the groundwater health screening levels (HSL) for vapour intrusion from the relevant depth and soil matrix applicable to low-high density residential land use (HSL A/B) from the NEPM (amended 2013). The NEPM does not provide groundwater HSL for water table shallower than 2m. Given the relatively shallow nature of the groundwater table (<2m) at the site and the requirement for basement excavation, a conservative criterion of “below limit of report (LOR)” has been adopted for these volatile petroleum chemicals. The groundwater HSL for sandy soils, 2m to <4m, have been included for screening and referencing purposes. In addition, regional screening levels (RSL) for Tapwater (USEPA, 2015) may be further considered for protective of future construction and maintenance workers and users of a basement structure (particularly intersecting the water table) if a volatile hydrocarbon compound exceeded the LOR.

Groundwater is expected to flow towards Brisbane Water. The Brisbane Water is expected to support marine aquatic ecosystems and recreational use. Therefore, the ANZECC (2000) water quality guidelines for protection of marine ecosystem and the relevant low reliability trigger values (95% protection for slightly to moderately disturbed ecosystem), as well as the guidelines for recreational water (based on drinking water guideline values with a 10 times multiplication factor applied for screening purposes) (NHMRC, 2011) were adopted.

The adopted groundwater investigation levels are presented in attached Table T5.

6.3. Hazardous Ground Gas

As a preliminary screening method as recommended in Guidelines for the Assessment and Management of Sites Impacted by Hazardous Ground Gases (NSW EPA, 2012), a methane concentration of 1.25% v/v was adopted as the preliminary screening criteria. This screening criteria was based on Benchmark Technique 16 in the Environmental Guidelines: Solid Waste Landfills (NSW EPA, 2016). Gas screen values (GSV) and the characteristic gas situations (CS) will then be considered based on NSW EPA (2012).

7. Results

7.1. Geological Subsurface Profiles

Based on field observations, a layer of fill was encountered generally a majority of the site. The fill layer was found to be up to 1.6m thick (but typically less than 1m in thickness). The fill generally comprises gravelly sand. Traces of ceramic and concrete fragments, likely associated with demolition of former building structures, were noted on the fill surface at a number of sampling locations. Timber beams, scrap metals and sandstone boulders were noted at TP1 (approx. 0.3m to 0.5m BGS). Timber beams were also noted at TP2 (approx. 1.5m BGS). No apparent asbestos fragments were visible at the sampling locations. Faint organic (hydrogen sulfur like) odour was noted at TP1 (approx. 0.3m to 0.5m BGS) and at TP2 (approx. 1.6m to 1.8m BGS). A vertical metal pipe was encountered from approximately 0.3m BGS at TP1, potentially related to underground services/infrastructure.

The fill was underlain by alluvial clay interbedded with sand, then residual sandy clay or clayey sand, and sandstone bedrock. A generalised geological subsurface profile was developed and presented in the Geotechnical Interpretative Report (Ref: SYDGE214942-AB), which is also reproduced in Table 7.1. Groundwater inflows were encountered in a number of boreholes. The standing groundwater levels in the monitoring wells were measured at depths between 1.7m and 2.0m BGL which corresponds to approximately 0.8m (MW1), 0.5m (MW2) and 2.3m (MW3) in AHD¹. This indicates broadly a net west to south-westerly flow towards Brisbane Water.

Borehole and test pit logs are presented in Appendix C.

¹ Top of casing for each well was not surveyed. Reduced levels (in AHD) of observed water table were estimated based on available ground surface levels only

Table 7.1: Generalised geotechnical units

Origin	Unit	Generalised description	Consistency range and rock strength
Fill	F1	Gravelly SAND, Gravelly Clayey SAND, Gravelly Silty SAND, Clayey SAND and SAND of fine to coarse grained and low to medium plasticity clay	N/A
Topsoil / Colluvium	C1	Silty CLAY and Silty SAND with trace of organics, fine to medium grained, low to medium plasticity	Firm clays and loose sands
Alluvial	A1	Sandy CLAY and Silty CLAY of low to high plasticity interbedded with, fine to medium grained Silty SAND, Clayey SAND and SAND	Generally firm to stiff clays interbedded with very loose to loose sands
Residual	R1	CLAY and Sandy CLAY of medium to high plasticity	Firm to stiff clays
	R2	CLAY, Sandy CLAY, Clayey SAND and extremely weathered Class V SANDSTONE bedrock	Very stiff to hard clays Very low strength bedrock
Bedrock	T1	Fine grained SANDSTONE with interbedded SILTSTONE	Medium strength bedrock
	T2	Fine to medium grained SANDSTONE with interbedded SILTSTONE	Medium to high strength bedrock

7.2. Soil Headspace Screening

PID readings were reported below 10ppm in all samples screened which indicate that significant concentrations of ionisable volatile organic compounds are unlikely to be present.

The PID results are presented in Appendix C.

7.3. Soil Results

The analytical results are tabulated in attached Table T1, with laboratory analytical certificates and chain of custody documentations presented in Appendix E.

The soil results are summarised as follows:

- Concentrations of chemicals analysed were below the adopted soil investigation levels (HIL-B, HSL-B, Residential Management Limits), with the exception of carcinogenic PAH (as benzo(a)pyrene TEQ).

- Carcinogenic PAH (as benzo(a)pyrene TEQ) exceeding the HIL-B was detected at BH8 (0.0-1.0m), at a concentration of 5.3mg/kg marginally above the HIL-B of 4mg/kg.
- Asbestos was detected below the laboratory limits of reporting (LOR).

7.4. Groundwater Results

The analytical results are tabulated in attached Table T5, with laboratory analytical certificates and chain of custody documentations presented in Appendix E.

The groundwater results are summarised as follows:

- With the exception of copper, concentrations of chemicals analysed were below the adopted groundwater investigation levels (protection of marine aquatic ecosystem, recreational water, HIL-B, HSL-A/B) and, specifically, hydrocarbon compounds were detected below laboratory's limits of reporting (LOR) with the exception of naphthalene.
- Trace levels of naphthalene were detected at concentrations up to 0.00017mg/L (MW2), below the USEPA Tapwater criteria. Given the groundwater HSL cannot be applied due to the shallow groundwater table (<2m), the result was further assessed using the estimated soil vapour concentration of 0.0035mg/m³ (based on Henry's Law constant of 0.0205). The estimated soil vapour concentration is well below the most conservative soil vapour HSL (sand, 0m to <1m) of 0.8mg/m³.
- Copper was detected at 0.002mg/L at MW2 marginally exceeding the investigation level for protection of marine aquatic ecosystem of 0.0013mg/L. However, the detected concentration is considered typical of background concentration in an urban setting.

7.5. Hazardous Ground Gas Results

The monitoring results are tabulated in Table 7.2.

Table 7.2: Summary of hazardous ground gas results

Well ID	Methane	Carbon dioxide	Oxygen	Gas flow ²	Gas screening value (GSV)	Characteristic gas situation (CS)
MW1	0% (v/v)	0.2% (v/v)	19.8% (v/v)	0L/h	0	very low risk
MW3	0.1% (v/v)	0% (v/v)	20.5% (v/v)	0L/h	0	very low risk
MW2	0.7% (v/v)	14% (v/v)	0.6% (v/v)	0L/h	0	low risk ³

The detected methane concentrations were below the adopted screening level of 1.25% (v/v). The characteristic gas situations (CS) were estimated to be very low to low risks.

² Flow measurement accuracy +/- 0.3L/h (GA5000)

³ Based on carbon dioxide concentrations being greater than 5% (v/v)

7.6. Acid Sulfate Soils

In addition to the DSI and assessment of suitability for the proposed development, selected soil samples were analysed for presence of acid sulfate soils.

A selection of soil samples from different depths were selected for pH/peroxide screening test undertaken by Eurofins. A summary of the screening test results are presented below:

- pH-F (prior to oxidation) ranged between pH5.5 and pH10
- pH-FOX (following oxidation) ranged between pH2.9 and pH8.4 (only one sample recorded pH-FOX <3)

Eight selected soil samples were further analysed using the SPOCAS method. A summary of laboratory results based on the SPOCAS method is presented in Table 7.3.

Table 7.3: Summary of SPOCAS results

Sample ID / depth	pH (KCl)	pH (Ox)	Sulfur (KCl Extractable) (%S)	Sulfur (Peroxide Oxidisable Sulfur) (%S)	Acid Neutralising capacity (S% pyrite)	SPOCAS (Net Acidity) (mol H+t)	SPOCAS (Liming Rate) (kg CaCO ₃ /t)
BH2 1.9-2.0m	5.0	4.6	<0.02	<0.02	n/a	<10	<1
BH3 2.75-3.0m	4.3	5.0	<0.02	<0.02	n/a	32	2.0
BH4 2.5-2.7m	4.6	4.2	<0.02	<0.02	n/a	22	2.0
P1 1.7-2.2m	4.5	4.0	<0.02	<0.02	n/a	21	2.0
P4 2.0-3.0m	4.1	4.5	<0.02	<0.02	n/a	45	3.0
BH6 1.6-2.0m	4.6	3.9	<0.02	<0.02	n/a	23	2.0
P8 2-2.3m	11	8.6	<0.02	<0.02	0.54	<10	<1
BH9 1.8-2.1m	8.8	7.4	<0.02	<0.02	0.15	<10	<1

The results indicate that the samples analysed (SPOCAS) did not contain potential and actual acid sulfate soils given that Sulfur (KCl extractable) and Peroxide Oxidisable Sulfur were both detected below laboratory's limits of reporting.

7.7. QA/QC Data Validation

A QA/QC data validation assessment was undertaken with respect to contamination testing for the purposes of this DSI.

Based on the assessment, the data is considered to be usable subject to the following consideration:

- Variability between primary and duplicate soil samples was likely attributable to the heterogeneity of contamination distribution in the material sampled

The assessment is presented in Appendix F.

8. Discussion

Discussions in relation to the identified AECs are presented in the following sections.

8.1. Hazardous Building Materials

Based on the results, Coffey considers that there is a low likelihood of widespread unacceptable impacts associated with hazardous building materials for the following reasons:

- Douglas Partners only identified one asbestos fragment at one location.
- No apparent asbestos fragments were visible at the sampling locations.
- Asbestos was detected below laboratory's limits of reporting (LORs) in samples submitted for laboratory analysis.
- Lead was detected well below the adopted soil investigation level (HIL-B).

While asbestos was not encountered during the DSI, the potential presence of asbestos fragments cannot be precluded given history of the site.

Coffey recommends implementation of an Unexpected Finds Protocol during excavation and construction to mitigate risks associated with new finds of previously undetected contamination.

8.2. Chemical storage rooms

Based on the results, Coffey considers that there is a low likelihood of unacceptable impacts associated with the chemical storage rooms for the following reasons:

- Whilst Douglas Partners did not clearly identify locations of the rooms, the rooms were reported to have concrete slabs and security doors. No spillage was previously reported. Douglas Partners considered there was a very low likelihood for contamination to exist associated with the chemical storage rooms.
- PID readings were below 10ppm, indicative of low likelihood of significant volatile contamination. No apparent oil staining or hydrocarbon odours attributable to the former chemical storage were encountered in the soil samples.
- Heavy metals, TRH and BTEX were detected well below the adopted soil investigation levels, indicating that site soils were unlikely to have been impacted by incidental spillages.

- Heavy metals, TRH and BTEX results in groundwater were generally below the adopted groundwater investigation levels, and/or typical of background concentrations, indicating that site groundwater was unlikely to have been impacted by incidental spillages.

8.3. Fill

Based on the results, Coffey considers that there is a low likelihood of widespread unacceptable impacts associated with site fill for the following reasons:

- With the exception of carcinogenic PAH at BH8 (0.0-1.0mBGL), concentrations of chemicals analysed were detected below the adopted soil investigation levels.
- Comparable results and findings were reported by Douglas Partners.

With respect to the marginal exceedance of carcinogenic PAH at BH8, Coffey considers that this exceedance is isolated, given that PAH was not detected in the deeper soil sample and also not detected in samples collected at TP3, located within 5m from BH8. The detection may also be associated with the asphalt pavement on the surface.

Timber beams and scrap metals were encountered in TP1 and TP2, which may present an unacceptable aesthetic impact.

Given the localised nature of impacts associated with carcinogenic PAH and anthropogenic materials, and in consideration that the proposed basement excavation will effectively remove these materials, it is assessed that these materials will not present significant health risk to future site users.

Based on the soil and groundwater results, it is considered that site groundwater was unlikely to have been adversely impacted by contaminated fill, if present from the site.

8.4. Hazardous Ground Gas

Based on the results, Coffey considers that there is a very low to low risk associated with the naturally occurring hazardous ground gas for the following reasons:

- Hazardous ground gas monitoring was undertaken by Douglas Partners at Bores 1, 4, 6, 8, 10, 12 and 23. With the exception of Bores 1, 10 and 12, these monitored Bores were located within the Current development footprint. Detectable levels of methane were recorded in Bores 1, 10 (both outside Current development footprint) and 23 (within the Current development footprint), but at concentrations below the screening level of 1.25% adopted by Douglas Partners.
- Coffey undertook additional hazardous ground gas monitoring utilising the three monitoring wells. Methane was detected up to 0.7% (v/v), below the adopted screening level of 1.25%. No positive gas flow was recorded in any of the wells monitored. The monitoring results are considered to be representative of relatively poor case scenario given the atmospheric pressure was relatively low (approximately 1010hPa) and falling at the time of monitoring. Tide was approximately mid height and rising, at the time of monitoring.

8.5. Construction Storage

At the time of the DSI, the site was used as a construction storage for the adjacent Stage 2 development. Construction equipment and materials were stored on site. The presence of these equipment and materials present limitations for this DSI as the footprints of these areas could not be assessed.

However, Coffey understands these equipment and materials will be removed. In addition, the proposed basement excavation would effectively remove potential superficial impacts, if present, associated with these construction equipment and material storages.

8.6. Acid Sulfate Soils

In addition to the DSI and assessment of suitability for the proposed development, a preliminary acid sulfate soils assessment was carried out.

Based on the results, it is considered that there is a relatively low likelihood of widespread presence of acid sulfate soils in the alluvial material from the site given that:

- pH-FOX were detected above pH3, with the exception of one sample
- Sulfur (KCl extractable) and Peroxide Oxidisable Sulfur were both detected below laboratory's limits of reporting

It is important to note that the results may have been impacted by storage of concrete/cement on site. Concrete/cement products are generally alkaline in nature.

The results do not preclude the potential presence of acid sulfate soils given the variable nature of environmental deposition and acid sulfate soil distribution. In addition, acid sulfate soils have previously been detected on site in the wider development (including Stage 1 and Stage 2). Given the above, implementation of an Acid Sulfate Soil Management Plan is recommended.

8.7. Waste Classification

In addition to the DSI and assessment of suitability for the proposed development, a preliminary waste classification was carried out to facilitate planning for the basement excavation.

Based on chemical characterisation of the site soils (Table T8), the site fill and near surface soil, if not mixed with asbestos or other materials, would likely be classified as General Solid Waste, subject to:

- Further confirmation testing including leachability tests (based on TCLP)
- A visual assessment of ground surface following removal of the construction equipment and material storages
- Implementation of an Unexpected Finds Protocol during excavation

Given asbestos fragments have been identified and cannot be precluded, the surface soil (top 100mm) would likely be classified as Special (Asbestos) Waste, unless the material is further assessed by an Asbestos Assessor certifying the material to be free of asbestos.

The natural alluvial materials cannot be classified as VENM due to the potential presence of acid sulfate soils.

9. Conclusion and Recommendations

Based on the findings, Coffey considers the site can be made suitable for the proposed mixed use residential/commercial development, subject to the following:

- Offsite disposal of basement excavation will be managed in accordance with waste classification guidelines and regulations. Following removal of the construction equipment and material stored during the DSI, an additional assessment should be carried comprising a visual assessment of the footprints of the construction equipment and material storages, as well as confirmation sampling and laboratory testing of the fill and surface soils to supplement the preliminary waste classification.
- Coffey also recommends implementation of an Unexpected Finds Protocol during excavation and construction, to address potential presence of asbestos (if any) and to mitigate risks associated with new finds of previously undetected contamination.

10. References

Douglas Partners (2014) Report on Preliminary Site Investigation for Contamination, Proposed Waterfront Development, Gosford Public School – Mann Street, Gosford (Project 75722.00).

NEPC (2013) National Environmental Protection (Assessment of Site Contamination) Measure 1999.

NSW EPA (2014) Waste Classification Guidelines, Part 1: Classifying Waste.

NSW EPA (2012) Guidelines for the Assessment and Management of Sites Impacted by Hazardous Ground Gases.

NSW EPA (2016) Environmental Guidelines: Solid Waste Landfills.

NSW OEH (2011) Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites. New South Wales Office of Environment and Heritage.

11. Limitations

The findings contained in this report are the result of discrete/specific methodologies used in accordance with acceptable practices and standards. To the best of our knowledge, they represent a reasonable interpretation of the general condition of the sampling points at the time the investigations were carried out. Under no circumstances, however, can it be considered that these findings represent the actual state of the site at all points. This report does not address issues relating to geotechnical or acid sulfate soils.

This report should be read in conjunction with the attached “Important Information About Your Coffey Environmental Report”.

Tables



	BTEX							Metals										OCP													
	Asbestos	Benzene	Ethylbenzene	Toluene	Xylene (m & p)	Xylene (o)	Xylene Total	Arsenic	Cadmium	Chromium	Copper	Lead	Lead (TCLP)	Mercury	Nickel	Nickel (TCLP)	Zinc	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endosulfan II	
PQL	g/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
	0.1	0.1	0.1	0.1	0.2	0.1	0.3	2	0.4	5	5	5	0.01	0.1	5	<0.05	5	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
CRC Care HSL-A/B, 0 to <1m, Sand Soils for Vapour Intrusion		0.5	57	160			40																								
CRC Care HSL-BResidential(High Density) Direct Contact		140	5900	21000			17000																								
CRC Care HSL-DCommercial / Industrial Direct Contact		430	27000	99000			81000																								
CRC Care HSL-DCommercial / Industrial Intrusive Maintenance Worker		1100	85000	120000			130000																								
CRC Care HSL-D, 0 to <1m, Sand Soils for Vapour Intrusion		3					230																								
HSL-intrusive maintenance worker, 0 to <2m, Sand for Vapour Intrusion		77																													
NEPM 2013 Commercial/Industrial D Soil HSL for Vapour Intrusion, 0 to <1m, Sand		3					230																								
NEPM 2013 HILs Commercial/Industrial D Soil								3000	900	3600	240000	1500		730	6000		400000				45		530				3600				
NEPM 2013 HILs Residential B Soil								500	150	500	30000	1200		120	1200		60000				10		90				600				
NEPM 2013 Mgmt Limits Commercial and Industrial, Coarse Soil																															
NEPM 2013 Mgmt Limits Residential, parkland and public open space, Coarse Soil																															
NEPM 2013 Residential Soil HSL A/B for Vapour Intrusion, 0 to <1m, Sand		0.5	55	160			40																								

Field_ID	Sample_Depth_Range	Sampled_Date-Time	Matrix_Description																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												



											PAH																							
	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Toxaphene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(a)pyrene (TCCLP)	Benzo(a)pyrene TEQ (LOR) *	Benzo(a)pyrene TEQ (Half) *	Benzo(a)pyrene TEQ (Zero) *	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Benzo[b+j]fluoranthene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c-d)pyrene	Naphthalene	Phenanthrene	Pyrene	Total PAHs			
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		
PQL	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	1	0.5	0.5	0.5	0.5	0.5	0.001	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		
CRC Care HSL-A/B, 0 to <1m, Sand Soils for Vapour Intrusion																																3		
CRC Care HSL-BResidential(High Density) Direct Contact																																2200		
CRC Care HSL-DCommercial / Industrial Direct Contact																																11000		
CRC Care HSL-DCommercial / Industrial Intrusive Maintenance Worker																																29000		
CRC Care HSL-D, 0 to <1m, Sand Soils for Vapour Intrusion																																		
HSL-intrusive maintenance worker, 0 to <2m, Sand for Vapour Intrusion																																		
NEPM 2013 Commercial/Industrial D Soil HSL for Vapour Intrusion, 0 to <1m, Sand																																		
NEPM 2013 HILs Commercial/Industrial D Soil		100				50		80	2500	160							40																4000	
NEPM 2013 HILs Residential B Soil		20				10		15	500	30							4																400	
NEPM 2013 Mgmt Limits Commercial and industrial, Coarse Soil																																		
NEPM 2013 Mgmt Limits Residential, parkland and public open space, Coarse Soil																																		
NEPM 2013 Residential Soil HSL A/B for Vapour Intrusion, 0 to <1m, Sand																													3					

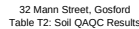
Well_ID	Sample_Depth_Range	Sampled_Date-Time	Matrix_Description																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														</



	Polychlorinated Biphenyls								TRH											
	Aroclor 1221	Aroclor 1016	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	PCBs (Sum of total)	C6-C10 less BTEX (F1)	F2-NAPHTHALENE	C6 - C10	C10-C16	C16-C34	C34-C40	C6 - C9	C10 - C14	C15 - C28	C29 - C36	C10 - C36 (Sum of total)	
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
PQL	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	20	50	20	50	100	100	20	20	50	50	50	
CRC Care HSL-A/B, 0 to <1m, Sand Soils for Vapour Intrusion									44			110								
CRC Care HSL-BResidential(High Density) Direct Contact									5600			4200	5800	8100						
CRC Care HSL-DCommercial / Industrial Direct Contact									26000			20000	27000	38000						
CRC Care HSL-DCommercial / Industrial Intrusive Maintenance Worker									82000			62000	85000	120000						
CRC Care HSL-D, 0 to <1m, Sand Soils for Vapour Intrusion									260											
HSL-intrusive maintenance worker, 0 to <2m, Sand for Vapour Intrusion																				
NEPM 2013 Commercial/Industrial D Soil HSL for Vapour Intrusion, 0 to <1m, Sand									260											
NEPM 2013 HILs Commercial/Industrial D Soil								7												
NEPM 2013 HILs Residential B Soil								1												
NEPM 2013 Mgmt Limits Commercial and Industrial, Coarse Soil											700	1000	3500	10000						
NEPM 2013 Mgmt Limits Residential, parkland and public open space, Coarse Soil											700	1000	2500	10000						
NEPM 2013 Residential Soil HSL A/B for Vapour Intrusion, 0 to <1m, Sand									45	110										

Field_ID	Sample_Depth_Range	Sampled_Date-Time	Matrix_Description																			
BH10_0.3-0.7	0.3-0.7	28-Feb-18	Soil	-	-	-	-	-	-	-	<20	<50	<20	<50	<100	<100	<20	<20	<50	65	65	
BH3_0.6-1.0	0.6-1	23-Feb-18	Soil	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
BH3_1.9-2.0	1.9-2	23-Feb-18	Soil	-	-	-	-	-	-	-	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
BH4_0.0-0.3	0.0-0.3	27-Feb-18	Soil	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
BH4_1.8-2.0	1.8-2.0	27-Feb-18	Soil	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
BH4_2.5-2.7	2.5-2.7	27-Feb-18	Soil	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
BH5_0.2-0.5	0.2-0.5	28-Feb-18	Soil	-	-	-	-	-	-	-	<20	<50	<20	<50	240	320	<20	<20	92	270	362	
BH5_0.6-0.9	0.6-0.9	28-Feb-18	Soil	-	-	-	-	-	-	-	<20	<50	<20	<50	170	210	<20	<20	63	180	243	
BH6_0.8-1.0	0.8-1.0	01-Mar-18	Soil	-	-	-	-	-	-	-	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
BH6_0-0.3	0-0.3	01-Mar-18	Soil	-	-	-	-	-	-	-	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
BH7_0-0.5	0-0.5	02-Mar-18	Soil	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
BH7_1.5-2.0	1.5-2.0	02-Mar-18	Soil	-	-	-	-	-	-	-	<20	<50	<20	<50	<100	<100	<20	<20	<50	58	58	
BH8_0.0-1.0	0.0-1.0	06-Mar-18	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<20	<50	<20	<50	120	<100	<20	<20	97	<50	97	
BH8_1.6-2.0	1.6-2.0	06-Mar-18	Soil	-	-	-	-	-	-	-	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
BH9_0.0-1.1	0.0-1.1	06-Mar-18	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
BH9_1.1-1.8	1.1-1.8	06-Mar-18	Soil	-	-	-	-	-	-	-	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
P1_0.3-0.5	0.3-0.5	28-Feb-18	Soil	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<50	<20	<50	170	200	<20	<20	71	180	251	
P2_0.7-0.8	0.7-0.8	27-Feb-18	Soil	-	-	-	-	-	-	-	<20	<50	<20	<50	<100	<100	<20	<20	<50	62	62	
P3_0.2-0.5	0.2-0.5	27-Feb-18	Soil	-	-	-	-	-	-	-	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
P4_0.2-0.5	0.2-0.5	27-Feb-18	Soil	-	-	-	-	-	-	-	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
P5_0.7-0.9	0.7-0.9	28-Feb-18	Soil	-	-	-	-	-	-	-	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
P6_0.2-0.6	0.2-0.6	28-Feb-18	Soil	-	-	-	-	-	-	-	<20	<50	<20	<50	<100	<100	<20	<20	<50	79	79	
P6_0.6-0.9	0.6-0.9	28-Feb-18	Soil	-	-	-	-	-	-	-	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
P7_1.1-1.3	1.1-1.3	28-Feb-18	Soil	-	-	-	-	-	-	-	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
P8_0.6-0.9	0.6-0.9	28-Feb-18	Soil	-	-	-	-	-	-	-	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
S1	0.0-0.05	27-Feb-18	Soil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S2	0.0-0.05	27-Feb-18	Soil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S3	0.0-0.05	27-Feb-18	Soil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S4	0.0-0.05	27-Feb-18	Soil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S5	0.0-0.05	27-Feb-18	Soil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
TP1_0.1-0.2	0.1-0.2	22-Feb-18	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
TP1_0.5-0.6	0.5-0.6	22-Feb-18	Soil	-	-	-	-	-	-	-	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
TP2_0.1-0.2	0.1-0.2	22-Feb-18	Soil	-	-	-	-	-	-	-	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
TP2_0.5-0.6	0.5-0.6	22-Feb-18	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
TP3_0.1-0.2	0.1-0.2	22-Feb-18	Soil	-	-	-	-	-	-	-	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
TP3_1.5-1.6	1.5-1.6	22-Feb-18	Soil	-	-	-	-	-	-	-	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
HA1-0.0-0.1	0.0-0.01	19-Mar-18	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
HA2-0.5-0.6	0.5-0.6	19-Mar-18	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	
DUP1		22-Feb-18	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
DUP2 (19/03/2018)	0.0-0.01	19-Mar-18	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
TRIP2 (19/03/2018)	0.0-0.01	19-Mar-18	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<10	<50	<10	<50	<100	<100	<10	<50	<100	<100	<50	
DUP6		06-Mar-18	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
DUP7		06-Mar-18	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
TRIP1		22-Feb-18	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	
TRIP5		06-Mar-18	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<20	<50	<20	<50	<100	<100	<20	<20	82	<50	82	
TRIP6		06-Mar-18	Soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<20	<50	<20	<50	<100	<100	<20	<20	<50	<50	<50	

NAD - No Asbestos Detected



*RPDs have only been considered where the concentration is greater than 80 times the EQL.



Lab Report Number	586434	586384	586989	589200	586434	586384	586989	589200
Field ID	TB1	TB2	TB3	TB4	TS1	TS1	TS3	TS4
Sampled_Date/Time	22-02-18	23-02-18	27-02-18	28-02-18	22-02-18	23-02-18	27-02-18	28-02-18
Sample Type	Trip B	Trip B	Trip B	Trip B	Trip S	Trip S	Trip S	Trip S

Chem_Group	ChemName	Units	EQL								
BTEX	Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	80%	110%	90%	90%
	Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	86%	100%	110%	89%
	Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	84%	100%	99%	87%
	Xylene (m & p)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	84%	100%	110%	87%
	Xylene (o)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	86%	100%	110%	87%
	Xylene Total	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	86%	100%	110%	87%
	C6-C10 less BTEX (F1)	mg/kg	20	<20		<20	<20				
	Naphthalene	mg/kg	0.5	<0.5		<0.5	<0.5	83%		120%	93%
TRH	C6 - C9	mg/kg	20	<20	<20	<20	<20	84%	100%	95%	86%
	C6 - C10	mg/kg	20	<20		<20	<20	84%		100%	88%



Lab Report Number	586434	586989
Field ID	R1	R1
Sampled Date/Time	22-02-18	27-02-18
Sample Type	Rinsate	Rinsate

Chem_Group	ChemName	Units	EQL		
BTEX	Benzene	µg/l	1	<1	<1
	Ethylbenzene	µg/l	1	<1	<1
	Toluene	µg/l	1	<1	<1
	Xylene (m & p)	µg/l	2	<2	<2
	Xylene (o)	µg/l	1	<1	<1
	Xylene Total	µg/l	3	<3	<3
	C6-C10 less BTEX (F1)	mg/l	0.02	<0.02	<0.02
Metals	Arsenic	mg/l	0.001	<0.001	
	Arsenic (Filtered)	mg/l	0.001		<0.001
	Cadmium	mg/l	0.0002	<0.0002	
	Cadmium (Filtered)	mg/l	0.0002		<0.0002
	Chromium	mg/l	0.001	<0.001	
	Chromium (Filtered)	mg/l	0.001		<0.001
	Copper	mg/l	0.001	<0.001	
	Copper (Filtered)	mg/l	0.001		<0.001
	Lead	mg/l	0.001	<0.001	
	Lead (Filtered)	mg/l	0.001		<0.001
	Mercury	mg/l	0.0001	<0.0001	
	Mercury (Filtered)	mg/l	0.0001		0.0003
	Nickel	mg/l	0.001	<0.001	
	Nickel (Filtered)	mg/l	0.001		<0.001
	Zinc	mg/l	0.005	0.008	
	Zinc (Filtered)	mg/l	0.005		0.018
OCP	4,4-DDE	µg/l	0.1	<0.1	<0.1
	a-BHC	µg/l	0.1	<0.1	<0.1
	Aldrin	µg/l	0.1	<0.1	<0.1
	Aldrin + Dieldrin	µg/l	0.1	<0.1	<0.1
	b-BHC	µg/l	0.1	<0.1	<0.1
	Chlordane	µg/l	1	<1	<1
	d-BHC	µg/l	0.1	<0.1	<0.1
	DDD	µg/l	0.1	<0.1	<0.1
	DDT	µg/l	0.1	<0.1	<0.1
	DDT+DDE+DDD	µg/l	0.1	<0.1	<0.1
	Dieldrin	µg/l	0.1	<0.1	<0.1
	Endosulfan I	µg/l	0.1	<0.1	<0.1
	Endosulfan II	µg/l	0.1	<0.1	<0.1
	Endosulfan sulphate	µg/l	0.1	<0.1	<0.1
	Endrin	µg/l	0.1	<0.1	<0.1
	Endrin aldehyde	µg/l	0.1	<0.1	<0.1
	Endrin ketone	µg/l	0.1	<0.1	<0.1
	g-BHC (Lindane)	µg/l	0.1	<0.1	<0.1
	Heptachlor	µg/l	0.1	<0.1	<0.1
	Heptachlor epoxide	µg/l	0.1	<0.1	<0.1



			Lab Report Number	586434	586989
			Field ID	R1	R1
			Sampled Date/Time	22-02-18	27-02-18
			Sample Type	Rinsate	Rinsate
	Hexachlorobenzene	µg/l	0.1	<0.1	<0.1
	Methoxychlor	µg/l	0.1	<0.1	<0.1
	Toxaphene	mg/l	0.01	<0.01	<0.01
PAH	Acenaphthene	µg/l	1	<1	<1
	Acenaphthylene	µg/l	1	<1	<1
	Anthracene	µg/l	1	<1	<1
	Benzo(a)anthracene	µg/l	1	<1	<1
	Benzo(a)pyrene	µg/l	1	<1	<1
	Benzo(g,h,i)perylene	µg/l	1	<1	<1
	Benzo(k)fluoranthene	µg/l	1	<1	<1
	Chrysene	µg/l	1	<1	<1
	Benzo[b+j]fluoranthene	mg/l	0.001	<0.001	<0.001
	Dibenz(a,h)anthracene	µg/l	1	<1	<1
	Fluoranthene	µg/l	1	<1	<1
	Fluorene	µg/l	1	<1	<1
	Indeno(1,2,3-c,d)pyrene	µg/l	1	<1	<1
	Naphthalene	µg/l	1	<10	<10
	Phenanthrene	µg/l	1	<1	<1
	Pyrene	µg/l	1	<1	<1
	Total PAHs	µg/l	1	<1	<1
PCBs	Aroclor 1221	µg/l	1	<1	<1
	Aroclor 1016	µg/l	1	<1	<5
	Aroclor 1232	µg/l	1	<1	<5
	Aroclor 1242	µg/l	1	<1	<5
	Aroclor 1248	µg/l	1	<1	<5
	Aroclor 1254	µg/l	1	<1	<5
	Aroclor 1260	µg/l	1	<1	<5
	PCBs (Sum of total)	µg/l	1	<1	<1
TPH	F2-NAPHTHALENE	mg/l	0.05	<0.05	<0.05
	C6 - C9	µg/l	20	<20	<20
	C10 - C14	µg/l	50	<50	<50
	C15 - C28	µg/l	100	<100	<100
	C29 - C36	µg/l	100	<100	<100
	C10 - C36 (Sum of total)	µg/l	100	<100	<100
	C10-C16	mg/l	0.05	<0.05	<0.05
	C16-C34	mg/l	0.1	<0.1	<0.1
	C34-C40	mg/l	0.1	<0.1	<0.1
	C6 - C10	mg/l	0.02	<0.02	<0.02



Lab Report Number	589200	587720
Field ID	R3	R4
Sampled Date/Time	28-02-18	02-03-18
Sample Type	Rinsate	Rinsate

Chem_Group	ChemName	Units	EQL		
BTEX	Benzene	µg/l	1	<1	<1
	Ethylbenzene	µg/l	1	<1	<1
	Toluene	µg/l	1	<1	<1
	Xylene (m & p)	µg/l	2	<2	<2
	Xylene (o)	µg/l	1	<1	<1
	Xylene Total	µg/l	3	<3	<3
	C6-C10 less BTEX (F1)	mg/l	0.02	<0.02	<0.02
Metals	Arsenic	mg/l	0.001	<0.001	<0.001
	Arsenic (Filtered)	mg/l	0.001		
	Cadmium	mg/l	0.0002	<0.0002	<0.0002
	Cadmium (Filtered)	mg/l	0.0002		
	Chromium	mg/l	0.001	<0.001	0.006
	Chromium (Filtered)	mg/l	0.001		
	Copper	mg/l	0.001	0.001	0.002
	Copper (Filtered)	mg/l	0.001		
	Lead	mg/l	0.001	<0.001	<0.001
	Lead (Filtered)	mg/l	0.001		
	Mercury	mg/l	0.0001	<0.0001	<0.0001
	Mercury (Filtered)	mg/l	0.0001		
	Nickel	mg/l	0.001	<0.001	0.002
	Nickel (Filtered)	mg/l	0.001		
	Zinc	mg/l	0.005	<0.005	0.027
	Zinc (Filtered)	mg/l	0.005		
OCP	4,4-DDE	µg/l	0.1	<0.1	<0.1
	a-BHC	µg/l	0.1	<0.1	<0.1
	Aldrin	µg/l	0.1	<0.1	<0.1
	Aldrin + Dieldrin	µg/l	0.1	<0.1	<0.1
	b-BHC	µg/l	0.1	<0.1	<0.1
	Chlordane	µg/l	1	<1	<1
	d-BHC	µg/l	0.1	<0.1	<0.1
	DDD	µg/l	0.1	<0.1	<0.1
	DDT	µg/l	0.1	<0.1	<0.1
	DDT+DDE+DDD	µg/l	0.1	<0.1	<0.1
	Dieldrin	µg/l	0.1	<0.1	<0.1
	Endosulfan I	µg/l	0.1	<0.1	<0.1
	Endosulfan II	µg/l	0.1	<0.1	<0.1
	Endosulfan sulphate	µg/l	0.1	<0.1	<0.1
	Endrin	µg/l	0.1	<0.1	<0.1
	Endrin aldehyde	µg/l	0.1	<0.1	<0.1
	Endrin ketone	µg/l	0.1	<0.1	<0.1
	g-BHC (Lindane)	µg/l	0.1	<0.1	<0.1
	Heptachlor	µg/l	0.1	<0.1	<0.1
	Heptachlor epoxide	µg/l	0.1	<0.1	<0.1



			Lab Report Number	589200	587720
			Field ID	R3	R4
			Sampled Date/Time	28-02-18	02-03-18
			Sample Type	Rinsate	Rinsate
	Hexachlorobenzene	µg/l	0.1	<0.1	<0.1
	Methoxychlor	µg/l	0.1	<0.1	<0.1
	Toxaphene	mg/l	0.01	<0.01	<0.01
PAH	Acenaphthene	µg/l	1	<1	<1
	Acenaphthylene	µg/l	1	<1	<1
	Anthracene	µg/l	1	<1	<1
	Benzo(a)anthracene	µg/l	1	<1	<1
	Benzo(a)pyrene	µg/l	1	<1	<1
	Benzo(g,h,i)perylene	µg/l	1	<1	<1
	Benzo(k)fluoranthene	µg/l	1	<1	<1
	Chrysene	µg/l	1	<1	<1
	Benzo[b+j]fluoranthene	mg/l	0.001	<0.001	<0.001
	Dibenz(a,h)anthracene	µg/l	1	<1	<1
	Fluoranthene	µg/l	1	<1	<1
	Fluorene	µg/l	1	<1	<1
	Indeno(1,2,3-c,d)pyrene	µg/l	1	<1	<1
	Naphthalene	µg/l	1	<10	<10
	Phenanthrene	µg/l	1	<1	<1
	Pyrene	µg/l	1	<1	<1
	Total PAHs	µg/l	1	<1	<1
PCBs	Aroclor 1221	µg/l	1	<1	<1
	Aroclor 1016	µg/l	1	<5	<5
	Aroclor 1232	µg/l	1	<5	<5
	Aroclor 1242	µg/l	1	<5	<5
	Aroclor 1248	µg/l	1	<5	<5
	Aroclor 1254	µg/l	1	<5	<5
	Aroclor 1260	µg/l	1	<5	<5
	PCBs (Sum of total)	µg/l	1	<1	<1
TPH	F2-NAPHTHALENE	mg/l	0.05	<0.05	<0.05
	C6 - C9	µg/l	20	<20	<20
	C10 - C14	µg/l	50	<50	<50
	C15 - C28	µg/l	100	<100	<100
	C29 - C36	µg/l	100	<100	<100
	C10 - C36 (Sum of total)	µg/l	100	<100	<100
	C10-C16	mg/l	0.05	<0.05	<0.05
	C16-C34	mg/l	0.1	<0.1	<0.1
	C34-C40	mg/l	0.1	<0.1	<0.1
	C6 - C10	mg/l	0.02	<0.02	<0.02

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32 Mann Street, Gosford
Table T6 - Groundwater QAQC Results

Client: St. Hilliers

Lab Report Number	590575	590575		590575	Interlab_D	
Field ID	MW1	DUP	RPD	MW1	TRIP	RPD
Sampled Date/Time	19-03-18	19-03-18		19-03-18	19-03-18	

Chem_Grd	ChemNam	Units	EQL						
BTEX	Benzene	µg/l	1	<1.0	<1.0	0	<1.0	<1.0	0
	Ethylbenzene	µg/l	1 (Primary): 2 (Interlab)	<1.0	<1.0	0	<1.0	<2.0	0
	Toluene	µg/l	1 (Primary): 2 (Interlab)	<1.0	<1.0	0	<1.0	<2.0	0
	Xylene (m)	µg/l	2	<2.0	<2.0	0	<2.0	<2.0	0
	Xylene (o)	µg/l	1 (Primary): 2 (Interlab)	<1.0	<1.0	0	<1.0	<2.0	0
	Xylene Tot	µg/l	3 (Primary): 2 (Interlab)	<3.0	<3.0	0	<3.0	<2.0	0
	C6-C10 les	mg/l	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Metals	Arsenic (Fi	mg/l	0.001	<0.001	<0.001	0	<0.001	0.002	67
	Cadmium (mg	mg/l	0.0002 (Primary): 0.0001	<0.0002	<0.0002	0	<0.0002	<0.0001	0
	Chromium	mg/l	0.001	<0.001	<0.001	0	<0.001	<0.001	0
	Copper (Fi	mg/l	0.001	<0.001	<0.001	0	<0.001	<0.001	0
	Lead (Filter	mg/l	0.001	<0.001	<0.001	0	<0.001	<0.001	0
	Mercury (F	mg/l	0.0001	<0.0001	<0.0001	0	<0.0001	<0.0001	0
	Nickel (Filt	mg/l	0.001	0.002	0.002	0	0.002	0.002	0
	Zinc (Filter	mg/l	0.005	<0.005	<0.005	0	<0.005	<0.005	0
PAH	Naphthalen	µg/l	10 (Primary): 5 (Interlab)	<10.0	<10.0	0	<10.0	<0.1	0
TPH	F2-NAPHT	mg/l	0.05 (Primary): 0.1 (Interlab)	<0.05	<0.05	0	<0.05	<0.1	0
	C6 - C9	µg/l	20	<20.0	<20.0	0	<20.0	<20.0	0
	C10 - C14	µg/l	50	<50.0	<50.0	0	<50.0	<50.0	0
	C15 - C28	µg/l	100	<100.0	<100.0	0	<100.0	<100.0	0
	C29 - C36	µg/l	100 (Primary): 50 (Interlab)	<100.0	<100.0	0	<100.0	<50.0	0
	C10 - C36	µg/l	100 (Primary): 50 (Interlab)	<100.0	<100.0	0	<100.0	<50.0	0
	C10-C16	mg/l	0.05 (Primary): 0.1 (Interlab)	<0.05	<0.05	0	<0.05	<0.1	0
	C16-C34	mg/l	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	C34-C40	mg/l	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	C6 - C10	mg/l	0.02	<0.02	<0.02	0	<0.02	<0.02	0

*RPDs have only been considered where a concentration is greater than 0 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 2000 (0-10 x EQL); 50 (10-20 x EQL)

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



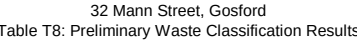
Lab Report Number	590364	590364
Field ID	TRIP BLANK Water	TRIP Spike Water
Sampled_Date/Time	19-03-18	19-03-18
Sample Type	Trip_B	Trip_S

Chem_Group	ChemName	Units	EQL		
BTEX	Benzene	µg/l	1	<1	80%
	Ethylbenzene	µg/l	1	<1	78%
	Toluene	µg/l	1	<1	78%
	Xylene (m & p)	µg/l	2	<2	78%
	Xylene (o)	µg/l	1	<1	84%
	Xylene Total	µg/l	3	<3	80%
	C6-C10 less BTEX (F1)	mg/l	0.02	<0.02	-
	Naphthalene	µg/l	1	<10	110%
	C6 - C9	µg/l	20	<20	89%
	C6 - C10	mg/l	0.02	<0.02	86%



	Asbestos	BTEX							Metals									OC														
		Benzene	Ethylbenzene	Toluene	Total BTEX	Xylene (m & p)	Xylene (o)	Xylene Total	Arsenic	Cadmium	Chromium	Copper	Lead	Lead TCLP	Mercury	Nickel	Nickel TCLP	Zinc	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	cis-Chlordane	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan	
PQL	g/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
CT1 NSW 2014 General Solid Waste (No Leaching)		10	600	288		0.2	0.1	1000	100	20	100	5	100		4	40		5	0.05	0.05	0.05	0.05	0.05	0.05			0.05	0.05	0.05	0.05	0.05	60
CT2 NSW 2014 Restricted Solid Waste (No Leaching)		40	2400	1152				4000	400	80	400		400		16	160																240
SCC1/TCLP1 NSW 2014 General Solid Waste (leached)		18	1080	518				1800	500	100	1900		1500	5	50	1050	2															108
SCC2/TCLP2 NSW 2014 Restricted Solid Waste (leached)		72	4320	2073				7200	2000	400	7600		6000	20	200	4200	8															432

ID	Sample_Depth_Range	Sampled_Date-Time	Lab_Report_Number	Matrix_Description																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								

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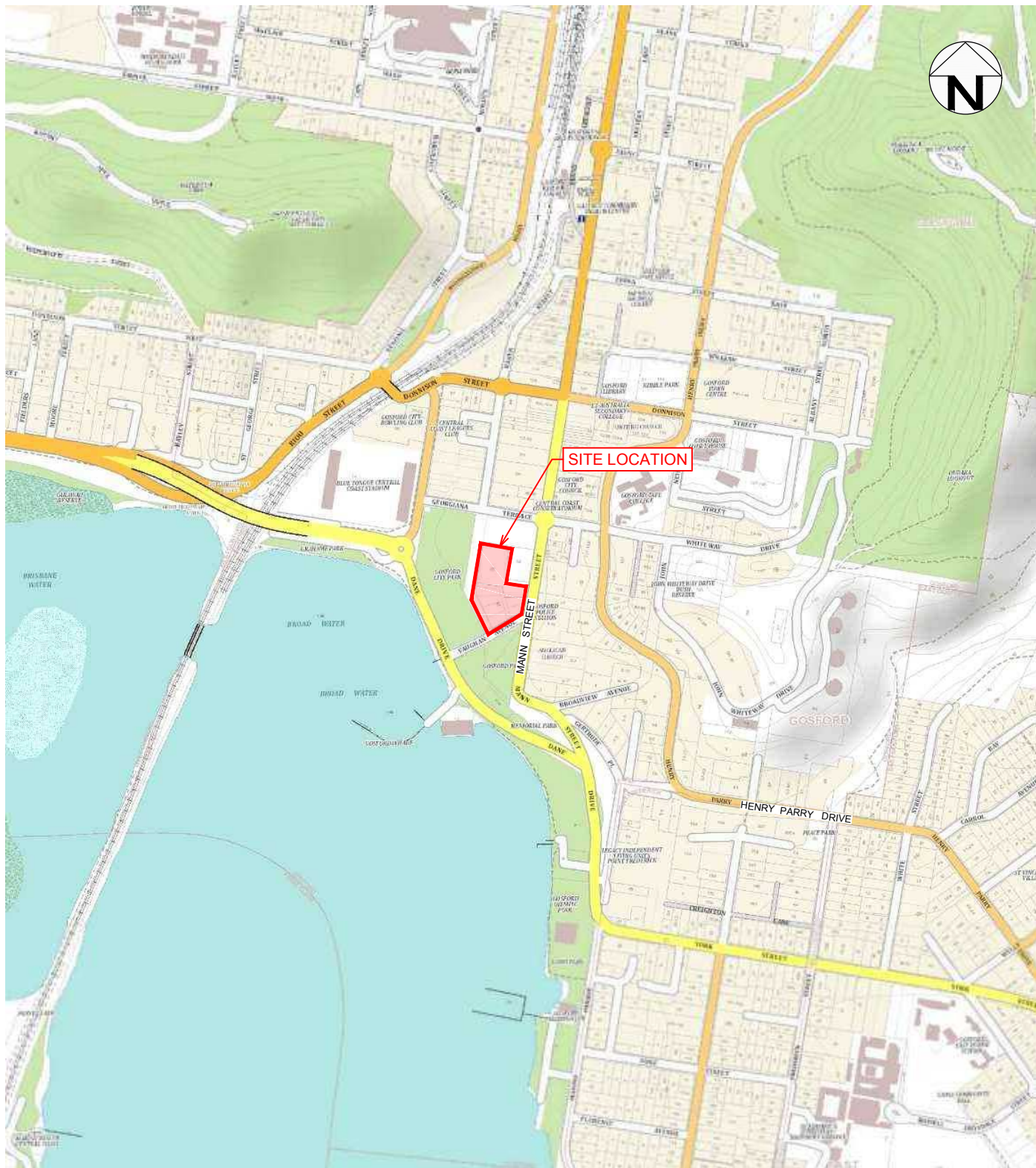


		Polychlorinated Biphenyls										TRH											
		Total PAHs	Aroclor 1221	Aroclor 1016	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1262	PCBs (Sum of total)	C6-C10 less BTEX (F1)	F2-NAPHTHALENE	C6 - C9	C10 - C14	C15 - C28	C29 - C36	C10 - C36 (Sum of total)	C6 - C10	C10-C16	C16-C34	C34-C40	
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
PQL		0.5	0.1	0.1	0.1	0.1	0.1	0.1		0.1	10	50	10	20	50	50	50	10	50	100	100		
CT1 NSW 2014 General Solid Waste (No Leaching)		200								50			650				10000						
CT2 NSW 2014 Restricted Solid Waste (No Leaching)		800								50			2600				40000						
SCC1/TCLP1 NSW 2014 General Solid Waste (leached)		200								50			650				10000						
SCC2/TCLP2 NSW 2014 Restricted Solid Waste (leached)		800								50			2600				40000						

Field_ID	Sample_Depth_Range	Sampled_Date-Time	Lab_Report_Number	Matrix_Description																						
BH10_0.3-0.7	0.3-0.7	28-Feb-18	589200	Soil	<0.5	-	-	-	-	-	-	-	-	-	<20	<50	<20	<20	<50	65	65	<20	<50	<100	<100	
BH3_0.6-1.0	0.6-1	23-Feb-18	586384	Soil	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
BH3_1.9-2.0	1.9-2	23-Feb-18	586384	Soil	<0.5	-	-	-	-	-	-	-	-	-	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
BH4_0.0-0.3		27-Feb-18	586989	Soil	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
BH4_1.8-0.2		27-Feb-18	586989	Soil	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
BH4_2.5-2.7		27-Feb-18	586989	Soil	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
BH5_0.2-0.5	0.2-0.5	28-Feb-18	589200	Soil	<0.5	-	-	-	-	-	-	-	-	-	<20	<50	<20	<20	92	270	362	<20	<50	240	320	
BH5_0.6-0.9	0.6-0.9	28-Feb-18	589200	Soil	<0.5	-	-	-	-	-	-	-	-	-	<20	<50	<20	<20	63	180	243	<20	<50	170	210	
BH6 (0.8-1.0M)		01-Mar-18	587720	Soil	<0.5	-	-	-	-	-	-	-	-	-	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
BH6 (0-0.3M)		01-Mar-18	587720	Soil	<0.5	-	-	-	-	-	-	-	-	-	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
BH7 (0-0.5M)		02-Mar-18	587720	Soil	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
BH7 (1.5-2.0M)		02-Mar-18	587720	Soil	<0.5	-	-	-	-	-	-	-	-	-	<20	<50	<20	<20	<50	58	58	<20	<50	<100	<100	
BH8 0.0-1.0M		06-Mar-18	588255	Soil	34.8	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<20	<50	<20	<20	97	<50	97	<20	<50	120	<100	
BH8 1.6-2.0M		06-Mar-18	588255	Soil	<0.5	-	-	-	-	-	-	-	-	-	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
BH9 0.0-1.1M		06-Mar-18	588255	Soil	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
BH9 1.1-1.8M		06-Mar-18	588255	Soil	<0.5	-	-	-	-	-	-	-	-	-	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
S1	0.0-0.05	27-Feb-18		Soil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S2	0.0-0.05	27-Feb-18		Soil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S3	0.0-0.05	27-Feb-18		Soil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S4	0.0-0.05	27-Feb-18		Soil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
S5	0.0-0.05	27-Feb-18		Soil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
DUP1		22-Feb-18	586434	Soil	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
DUP2		19-Mar-18	590364	Soil	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
DUP6		06-Mar-18	588255	Soil	3.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
DUP7		06-Mar-18	588255	Soil	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
HA1-0.0-0.1	0-0.1	19-Mar-18	590364	Soil	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
HA2-0.5-0.6	0.5-0.6	19-Mar-18	590364	Soil	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	
P1_0.3-0.5	0.3-0.5	28-Feb-18	589200	Soil	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<20	<50	<20	<20	71	180	251	<20	<50	170	200	
P2_0.7-0.8	0.7-0.8	27-Feb-18	589200	Soil	<0.5	-	-	-	-	-	-	-	-	-	<20	<50	<20	<20	<50	62	62	<20	<50	<100	<100	
P3_0.2-0.5	0.2-0.5	27-Feb-18	589200	Soil	<0.5	-	-	-	-	-	-	-	-	-	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
P4_0.2-0.5	0.2-0.5	27-Feb-18	589200	Soil	<1	-	-	-	-	-	-	-	-	-	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
P5_0.7-0.9	0.7-0.9	28-Feb-18	589200	Soil	<0.5	-	-	-	-	-	-	-	-	-	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
P6_0.2-0.6	0.2-0.6	28-Feb-18	589200	Soil	<0.5	-	-	-	-	-	-	-	-	-	<20	<50	<20	<20	<50	79	79	<20	<50	<100	<100	
P6_0.6-0.9	0.6-0.9	28-Feb-18	589200	Soil	<0.5	-	-	-	-	-	-	-	-	-	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
P7_1.1-1.3	1.1-1.3	28-Feb-18	589200	Soil	<0.5	-	-	-	-	-	-	-	-	-	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
P8_0.6-0.9	0.6-0.9	28-Feb-18	589200	Soil	<0.5	-	-	-	-	-	-	-	-	-	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
TP1_0.1-0.2	0.1-0.2	22-Feb-18	586434	Soil	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
TP1_0.5-0.6	0.5-0.6	22-Feb-18	586434	Soil	<0.5	-	-	-	-	-	-	-	-	-	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
TP2_0.1-0.2	0.1-0.2	22-Feb-18	586434	Soil	20	-	-	-	-	-	-	-	-	-	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
TP2_0.5-0.6	0.5-0.6	22-Feb-18	586434	Soil	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
TP3_0.1-0.2	0.1-0.2	22-Feb-18	586434	Soil	1.8	-	-	-	-	-	-	-	-	-	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
TP3_1.5-1.6	1.5-1.6	22-Feb-18	586434	Soil	<0.5	-	-	-	-	-	-	-	-	-	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
TRIP1		22-Feb-18	586434	Soil	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	
TRIP2		19-Mar-18	EM1805105	Soil	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<10	<50	<10	<50	<100	<100	<50	<10	<50	<100	<100	
TRIP5		06-Mar-18	588255	Soil	33.9	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<20	<50	<20	<20	82	<50	82	<20	<50	<100	<100	
TRIP6		06-Mar-18	588255	Soil	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<20	<50	<20	<20	<50	<50	<50	<20	<50	<100	<100	

NAD - No Asbestos Detected
PQL - Practical Quantification Limit

Figures



Scale (metres) 1:10000

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drawn	SH / AW
approved	-
date	4 / 04 / 18
scale	AS SHOWN
original size	A4



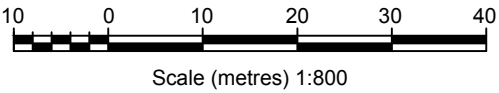
client:	ST HILLIERS		
project:	GEOTECHNICAL AND ENVIRONMENTAL ASSESSMENT 32 MANN STREET, GOSFORD, NSW		
title:	SITE LOCATION PLAN		
project no:	754-SYD214942-AC	figure no:	FIGURE 1
		rev:	A



revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE			

LEGEND

-  SITE BOUNDARY
-  APPROXIMATE MONITORING WELL LOCATION



Scale (metres) 1:800

drawn	SH / AW
approved	-
date	4 / 04 / 18
scale	AS SHOWN
original size	A3



client:	ST HILLIERS		
project:	GEOTECHNICAL AND ENVIRONMENTAL ASSESSMENT 32 MANN STREET, GOSFORD, NSW		
title:	MONITORING WELL LOCATION PLAN		
project no:	754-SYD214942-AC	figure no:	FIGURE 3
		rev:	A

Appendix A - Site Survey Plan and Concept Design Drawings

Notes:

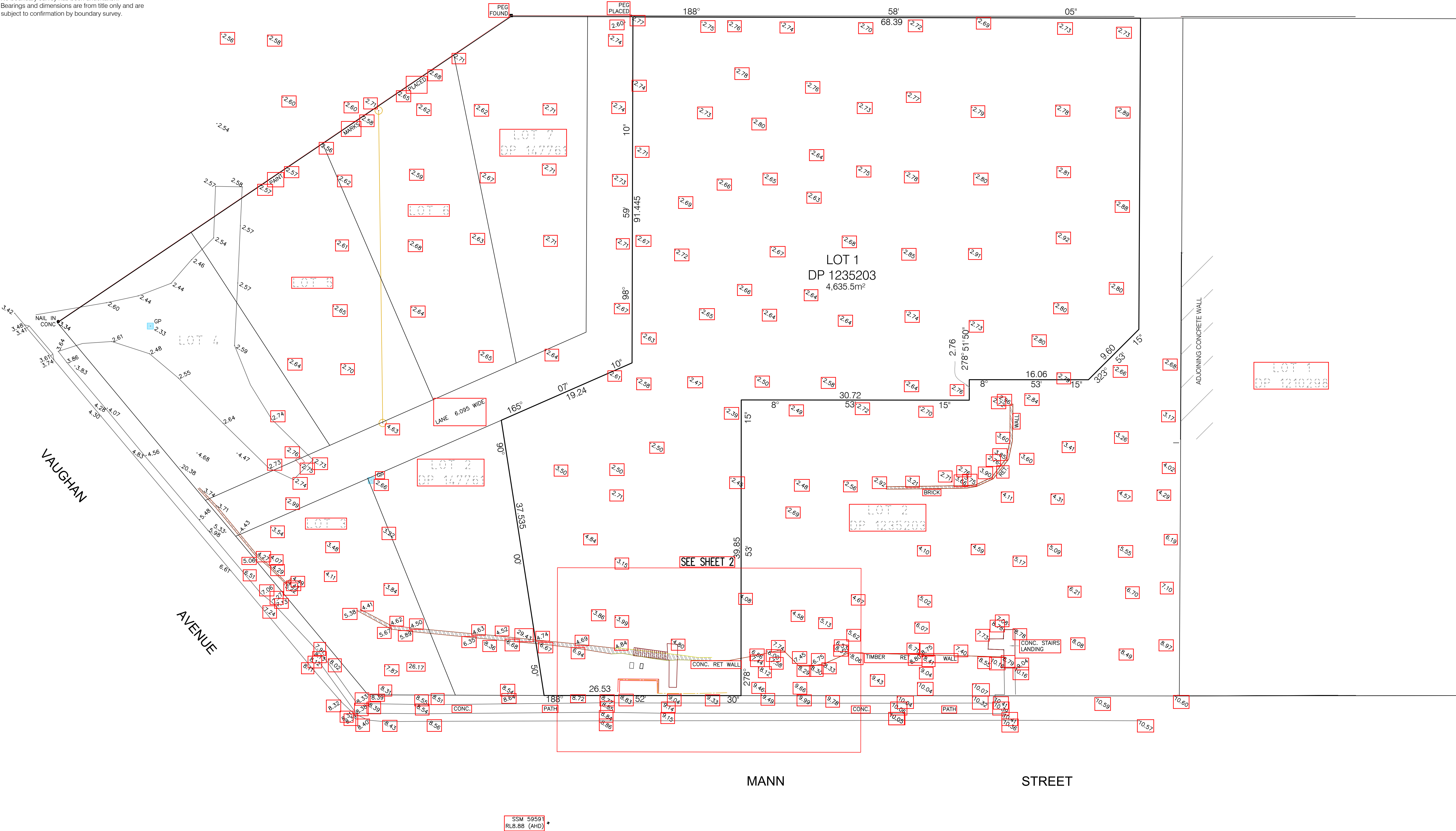
Levels are based on Australian Height Datum (AHD)
using SSM 59591

with a reduced level RL8.88

Class B

Order 2

No boundary survey has been undertaken.
Bearings and dimensions are from title only and are
subject to confirmation by boundary survey.

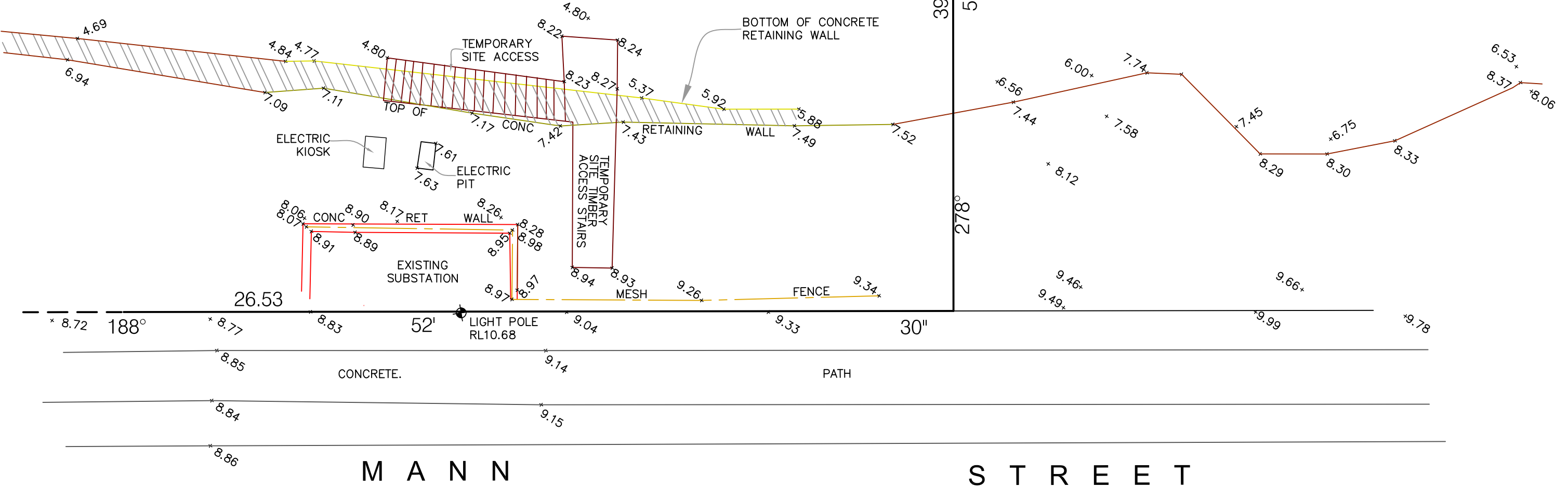


veris T: 1300 765 315 F: 1300 765 316 E: info@veris.com.au W: www.veris.com.au	Head Office (NSW) Level 1, 183 Durrumbah Road Mosman NSW 2088 PO Box 186, Cremorne NSW 2090	Issue	Amendment	Date	LEGEND	CLIENT ST. HILLIERS PROPERTY PTY LTD	PROJECT 32 MANN STREET GOSFORD	TITLE INFORMATION Lot: 1 Plan No.: 1235203 Title / Folio: 1/1235203 L.G.A.: CENTRAL COAST Parish: GOSFORD County: NORTHUMBERLAND	QUALITY ASSURANCE Surveyor: DF Drawn: BA Checked by: DF Date: 13/02/18 Approved by: SL Date: 13/02/18	COPYRIGHT © THIS DOCUMENT IN BOTH ELECTRONIC AND HARD COPY IS CONFIDENTIAL AND REMAINS THE PROPERTY OF VERIS PTY LTD. IT MUST NOT BE REPRODUCED, COPIED, EITHER WHOLLY OR PARTIALLY, OR FOR ANY OTHER PROJECT WITHOUT THE WRITTEN APPROVAL OF VERIS PTY LTD.	Date of Survey: 29/01/18 & 8-10/05/17 Datum: AHD Scale: 1:250 Cad ref.: 173672-DETL-001C	Date of Plan: 12/02/18 Co-ords: MGA (Original size A1) Sheet 1 of 2	
DRAWING TITLE DETAIL SURVEY										JOB NUMBER 173672		DRAWING NUMBER / ISSUE DETL-001/C	

MGA

LOT 1
DP 1235203

LOT 2
DP 1235203



M A N N S T R E E T



Head Office (NSW)
Level 1, 183 Ourimbah Road
Mosman NSW 2088
PO Box 198, Cremorne
NSW 2090
T: 1300 765 315
F: 1300 765 316
E: info.nsw@veris.com.au
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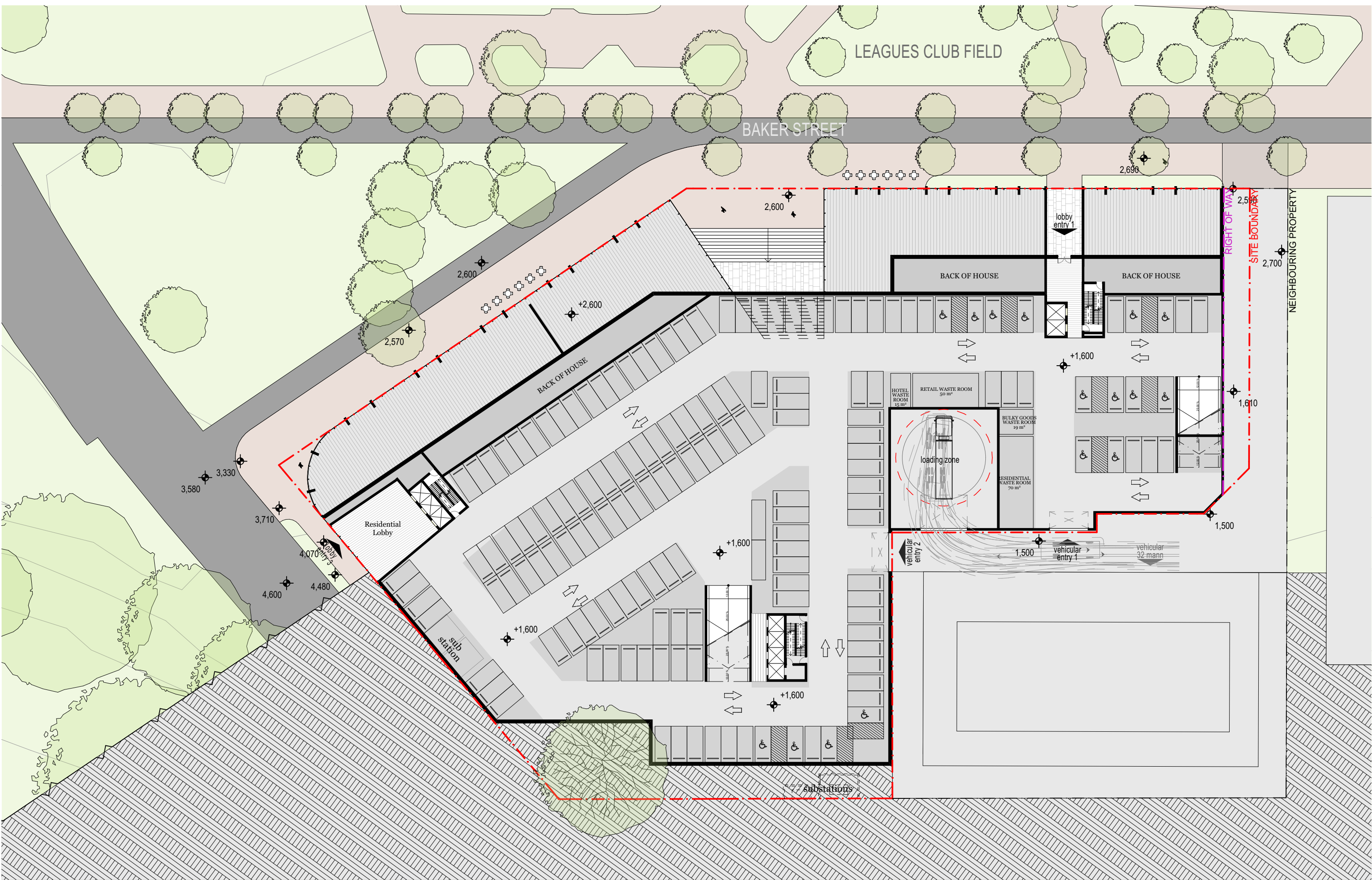
PROJECT
32 MANN STREET
GOSFORD
DRAWING TITLE
PART DETAIL & LEVELS SURVEY

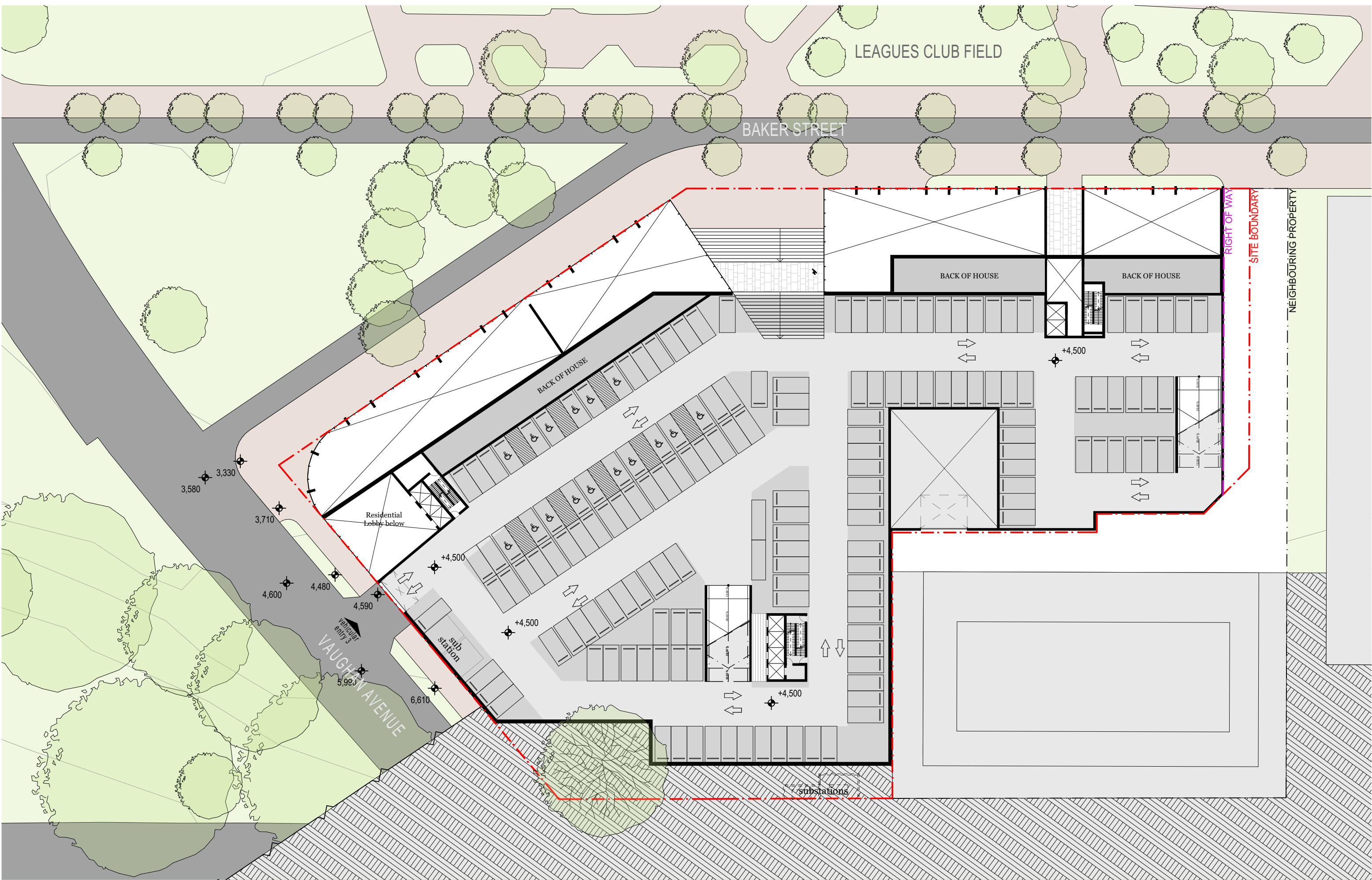
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Title / Folio: 1/1235203
L.G.A.: CENTRAL COAST
Parish: GOSFORD
County: NORTHUMBERLAND

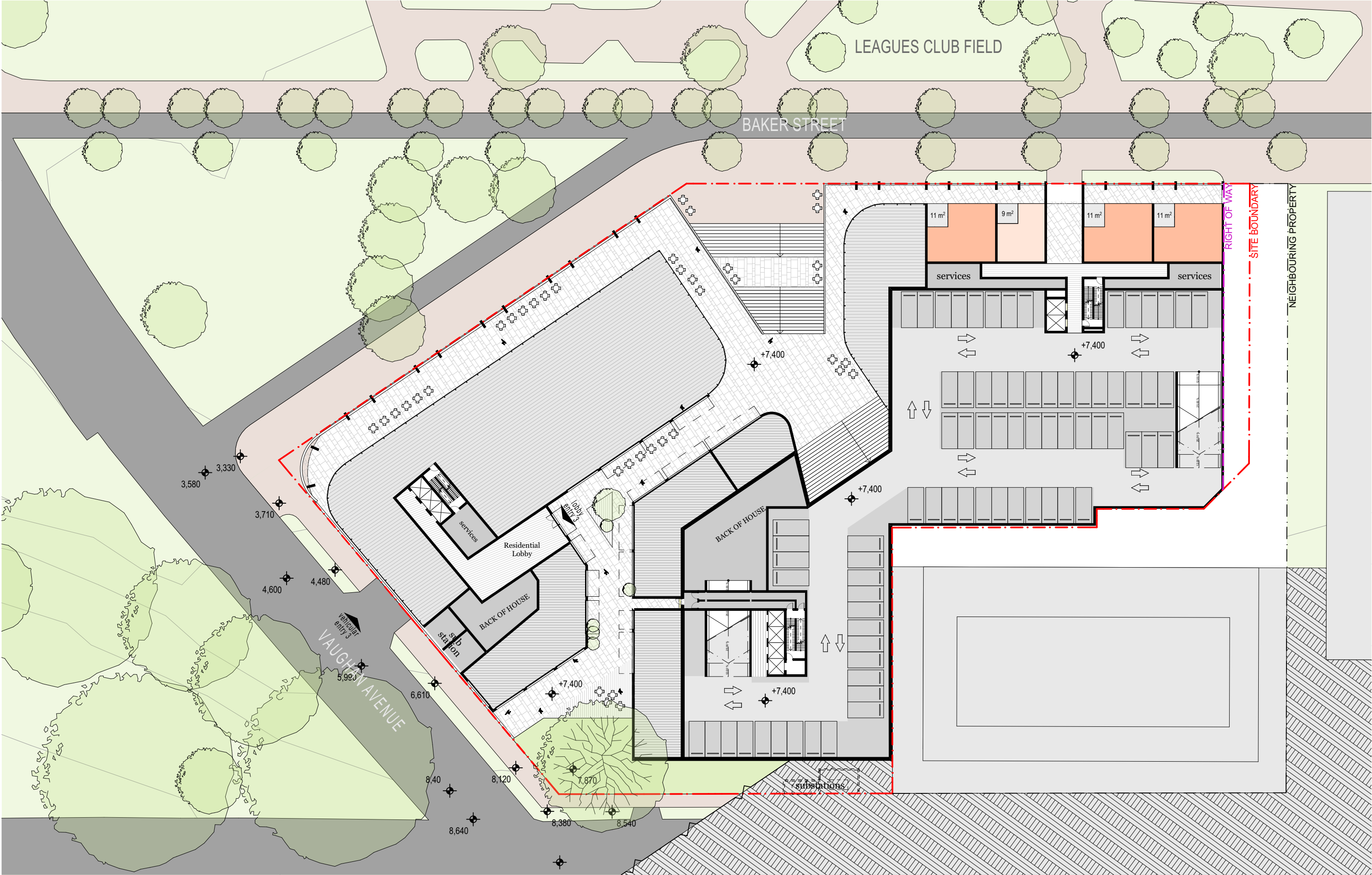
QUALITY ASSURANCE
Surveyor: DF
Drawn: BA
Checked by: DF Date: 13/02/18
Approved by: SL Date: 13/02/18
COMPLETION OF QUALITY ASSURANCE IS EVIDENCE THAT THE SURVEY WORKS UNDERTAKEN AND THE DRAWING HAVE BEEN VERIFIED AS CONFORMING WITH THE REQUIREMENTS OF THE QUALITY PLAN, WHERE THE QUALITY ASSURANCE IS INCOMPLETE ALL INFORMATION ON THIS DRAWING IS INTENDED FOR PRELIMINARY PURPOSES ONLY AS IT IS UNCHECKED.

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Cad ref : 173672
JOB NUMBER 173672
DRAWING NUMBER / ISSUE DETL-001/C
Date of Survey: 23/01/18
Date of Plan: 12/02/18
Datum: AHD
Co-ords: MGA
Scale: 1:100 (Original size A3)
Sheet 2 of 2







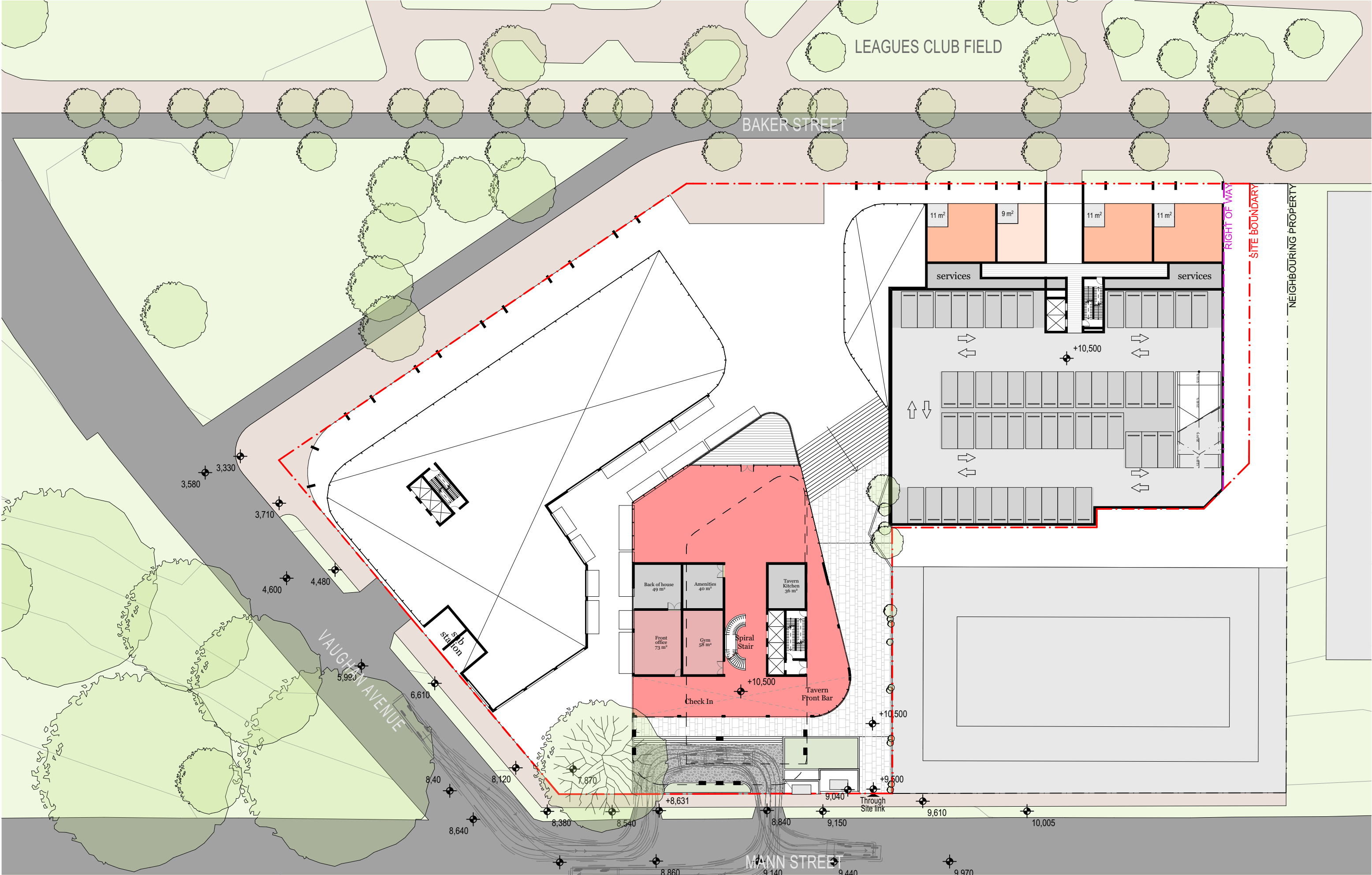


DKO

26 Mann Street
Gosford
NSW 2250

26-32 Mann Street
Level Two (Vaughan Ave)
Tuesday, 13 August 2019
Scale: 1:500

Revision: P4



26 Mann Street
Gosford
NSW 2250

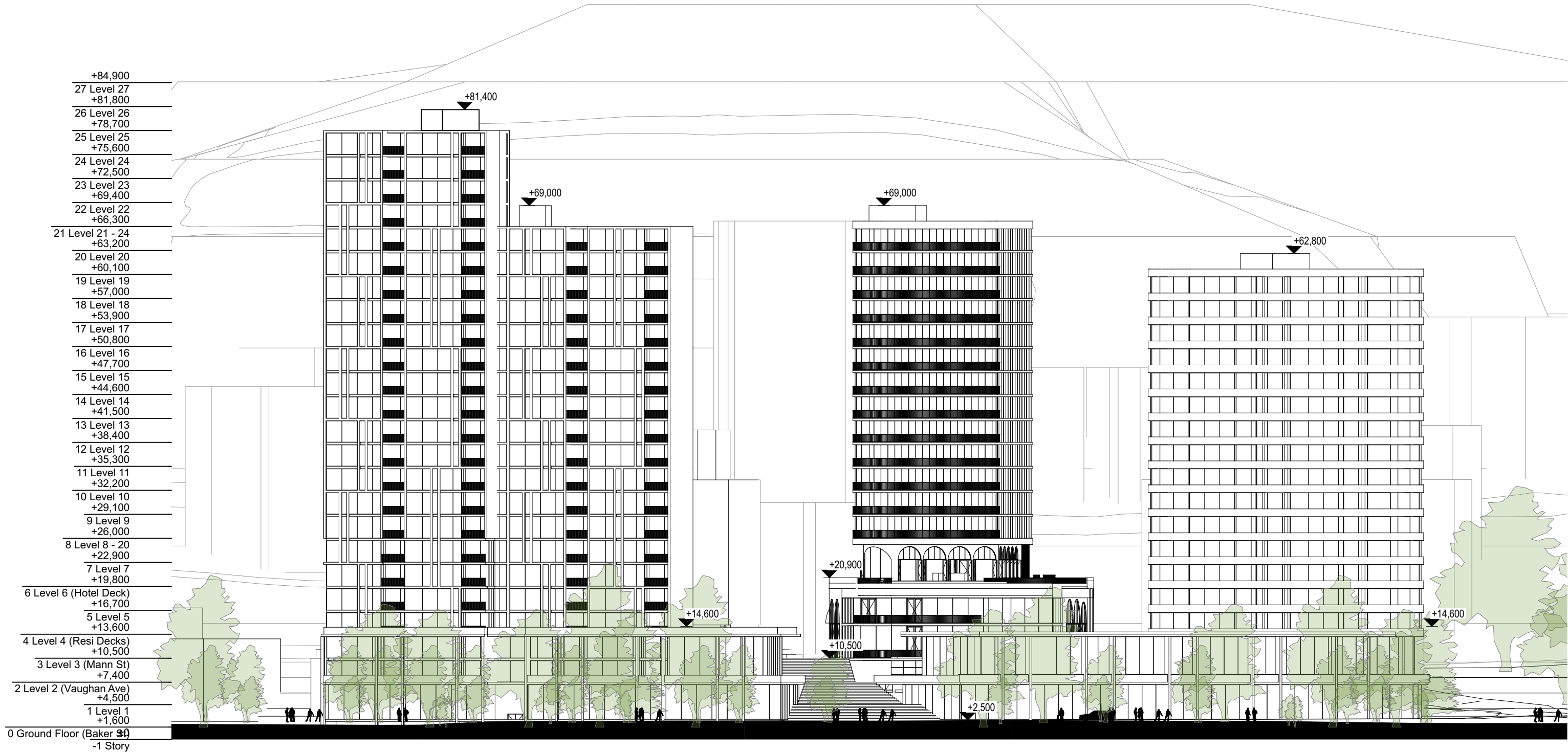
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Level Three (Mann St)
Tuesday, 13 August 2019
Scale: 1:500
Revision: P4

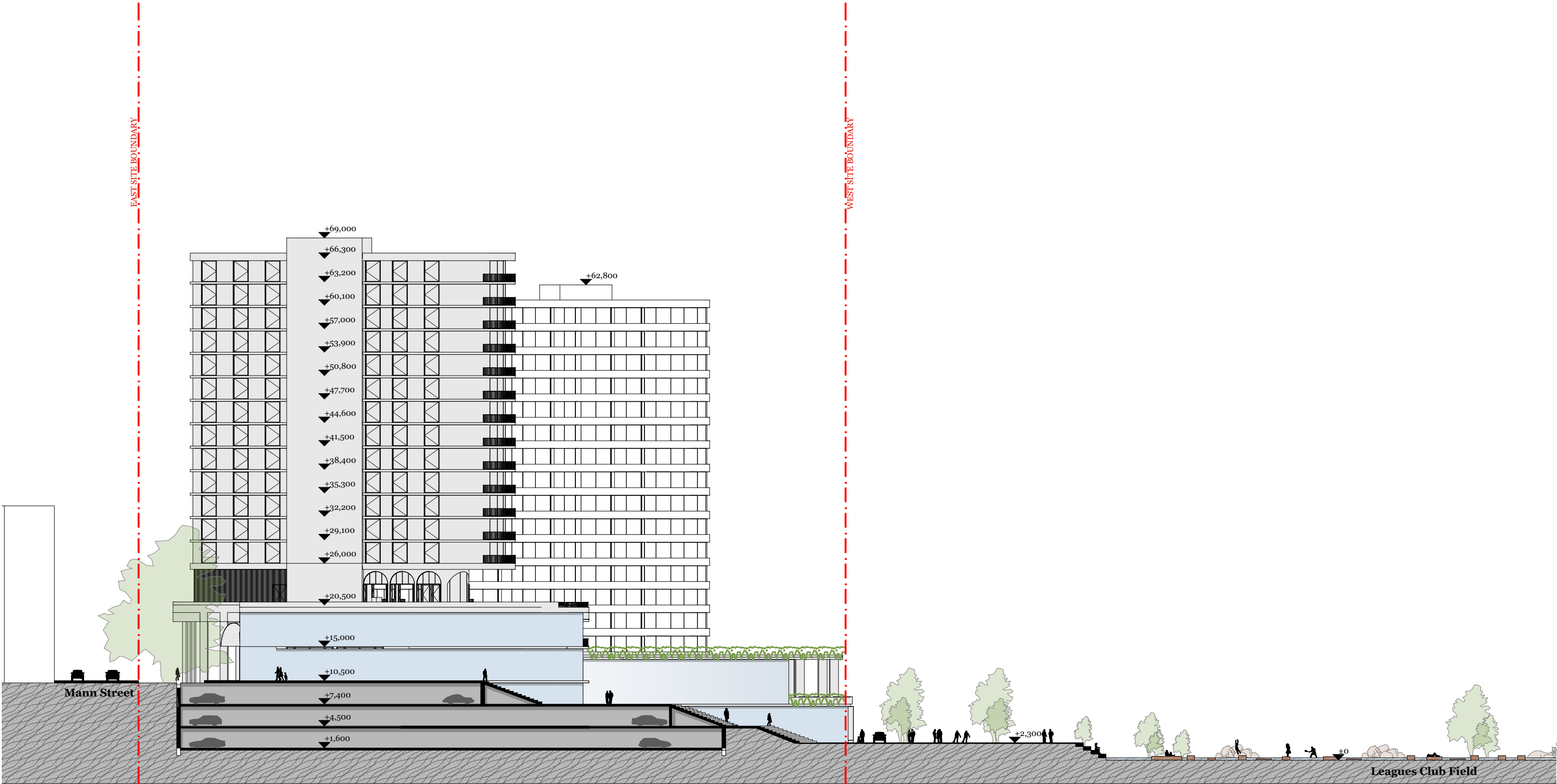








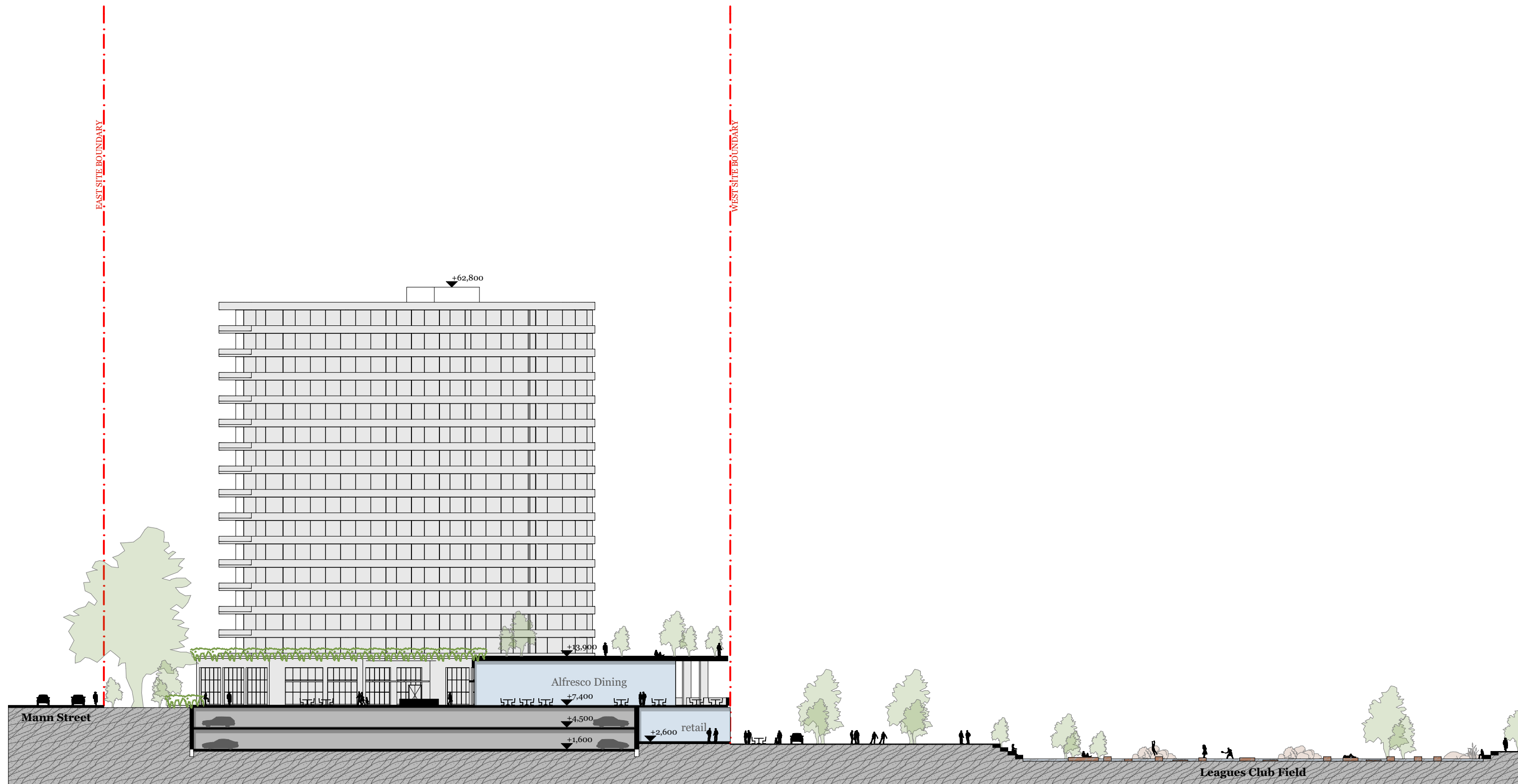




D K O

26 Mann Street
Gosford
NSW 2250

26-32 Mann Street
Site Section A
Tuesday, 13 August 2019
Scale: 1:500
Revision: P2



DKO

26 Mann Street
Gosford
NSW 2250

26-32 Mann Street
Site Section B
Tuesday, 13 August 2019
Scale: 1:500
Revision: P2

Appendix B – Extracts of Douglas Partners PSI Report

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Table 7: Results of Soil Analysis (All results in mg/kg unless otherwise stated)

Sample ID	Sample Depth	Sample type	Sampling Date	Heavy Metals								PAH				TRH				Benzene	Toluene	Ethylbenzene	Total Xylene	PCB ²	OCP ⁵	Asbestos	
				As	Cd	Cr ¹	Cu	Pb	Hg	Ni	Zn	B(a)P	B(a)P TEQ	Naphthalene	total ²	F1 (C ₆ -C ₁₀)	F2 (>C ₁₀ -C ₁₆)	F3 (>C ₁₆ -C ₃₄)	F4 (>C ₃₄ -C ₄₀)								
1	0.1	F	13/01/2014	5	ND	14	8	35	0.1	4	57	0.07	ND	0.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1	1.2	N	13/01/2014	ND	ND	10	ND	4	ND	ND	1	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	
QA6 (1/1.2)		N	13/01/2014	ND	ND	5	ND	4	ND	ND	1	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	
2	0.5	F	13/01/2014	8	ND	13	6	13	ND	6	30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
3	0.05	F	10/01/2014	ND	ND	13	18	50	0.1	9	93	1.4	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
4	0.5	F	13/01/2014	20	ND	10	4	18	ND	3	15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5	0.5	F	13/01/2014	ND	ND	8	1	7	ND	2	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
6	0.1	F	13/01/2014	5	ND	21	4	14	ND	3	9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
7	0.5	F	13/01/2014	ND	ND	10	7	31	ND	3	18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
7	1.6	N	13/01/2014	7	ND	11	18	180	ND	7	77	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	
8	0.5	F	13/01/2014	5	ND	19	1	13	ND	2	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
9	0.5	F	13/01/2014	5	ND	17	5	28	ND	ND	23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
10	0.5	F	13/01/2014	ND	ND	6	ND	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
QA5 (10/0.5)		F	13/01/2014	ND	ND	11	ND	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	
11	0.4	F	9/01/2014	ND	ND	15	4	40	ND	5	18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
12	0.1	F	9/01/2014	ND	ND	14	13	14	ND	11	65	0.05	ND	0.28	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	ND	-	
12	0.5	F	9/01/2014	ND	0.6	15	6	360	0.1	2	430	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	
13	1.0	F	9/01/2014	ND	ND	12	8	12	ND	5	23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
QA1 (13/1.0)		F	9/01/2014	5	ND	14	10	13	ND	6	29	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	
14	0.1	F	14/01/2014	ND	ND	11	23	69	0.1	9	180	0.18	ND	1.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
QA7 (14/0.1)		F	14/01/2014	ND	ND	10	25	85	ND	9	180	0.43	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	
15	0.05	F	14/01/2014	ND	ND	5	13	16	0.1	6	200	-	-	-	-	-	-	-	-	-	-	-	-	0.4	ND	ND	
15	0.5	N	14/01/2014	9	ND	6	180	360	0.6	5	140	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	
16	0.1	N	13/01/2014	ND	ND	8	3	12	ND	3	19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
17	0.05	N	10/01/2014	ND	ND	10	9	33	ND	3	42	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
18	0.1	N	10/01/2014	ND	ND	4	25	27	ND	2	25	2.6	4	ND	29	ND	1700	640	ND	ND	ND	ND	ND	ND	ND	ND	
19	0.1	F	10/01/2014	ND	ND	10	18	80	0.1	5	120	0.63	1	ND	5.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
20	0.05	N	10/01/2014	ND	ND	16	23	47	3.8	7	57	0.17	ND	ND	1.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
21	0.05	F	10/01/2014	ND	ND	9	12	290	ND	3	96	0.15	ND	ND	1.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
21/FC	0.0	FC	10/01/2014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Asbestos Detected		
21	1.0	N	10/01/2014	ND	ND	5	ND	6	ND	1	13	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	
22	0.1	F	10/01/2014	5	ND	14	9	49	ND	5	43	1.1	1	ND	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
23	0.8	F	10/01/2014	8	ND	15	8	14	ND	6	21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
24	0.1	F	13/01/2014	20	ND	37	51	59	ND	6	140	0.31	ND	ND	3	ND	370	120	ND	ND	ND	ND	ND	ND	ND	ND	
25	0.15	F	8/01/2014	ND	ND	11	8	7	ND	5	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
25	0.5	F	8/01/2014	4	ND	11	5	11	ND	5	26	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	
26	0.05	F	8/01/2014	ND	ND	6	6	3	ND	4	14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
26/FC	-	FC	8/01/2014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Asbestos Detected		
26	1.0	N	8/01/2014	ND	ND	9	6	37	ND	2	19	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	
PQL				4	0.4	1	1	1	0.1	1	1	0.05	0.5	0.1	0.2	25	50	100	100	0.2	0.5	1	3	0.1	0.1	0.1g/kg	
Site Assessment Criteria (SAC)																											
NEPM HIL/HSL ³				100	20	100	6000	300	40	400	7400	NC	3	3	300	45	110	2500	10000	0.5	160	55	40	1	240/6/50/270/10/6/10/300	no detect	
NEPM EIL/ESL ⁴				100	NC	190-400	60-230	1100	NC	30-560	70-1300	0.7	NC	170	NC	180	120	300	2800	50	85	70	45	NC	NC	NC	NC

Notes:

- 1

All Chromium are assumed to exist in the stable Cr(III) oxidation state, as Cr(VI) will be too reactive and unstable under the normal environment
- 2

where analytical results below laboratory practical quantitation limit (PQL) for all compounds, results quoted as ND of most compounds
- 3

Guideline on Health Investigation/Screening Levels for Soil and Groundwater (NEPM, 1999 – amended 2013) - Low density residential land use with accessible soil, HIL – A / HSL – A
- 4

Guideline on Ecological Investigation/Screening Levels for Soil and Groundwater (NEPM, 1999 – amended 2013) - Urban residential and public open space end use, EIL / ESL
- 5

OCF thresholds given in order DDT +DDD +DDE, Aldrin + Dieldrin, Chlordane, Endosulfan, Endrin, Heptachlor, HCB, Methoxychlor
- ND

Not detected at reporting limit of
- not analysed / not applicable
- PQL

Laboratory practical quantative limit
- Bold**

Exceeds NEPM EIL/ESL⁴ criteria
- Bold**

Exceeds NEPM HIL/HSL³ criteria
- FIN/FC/S

Filling / Natural / Fibre Cement / Sediment



NOTES:

Drawing adapted from aerial photograph sourced from <http://maps.six.nsw.gov.au/>

LEGEND:



Approximate borehole location

Douglas Partners Geotechnics Environment Groundwater CLIENT: Central Coast OFFICE: NTS SCALE: BJK	TITLE: Test Location Plan Preliminary Site (Contamination) Investigation Gosford Public School PROJECT No: 75722.00 DRAWING No: 1 REVISION: A

APPENDIX F

QUALITY ASSURANCE/QUALITY CONTROL FOR SOIL SAMPLING

.....

Quality Assurance (QA) was maintained by:

- compliance with a brief Sampling Analysis Quality Plan (SAQP) written to achieve the objectives of the study;
- using a qualified engineering geologist and engineer to undertake the field supervision and sampling;
- following the DP operating procedures for sampling, field testing and decontamination as presented in Table F1;
- using NATA accredited laboratories for sample testing, that generally utilise standard laboratory methods of the US EPA, the APHA and NSW EPA.

Table F1: Field Procedures

Abbreviation	Procedure Name
FPM LOG	Logging
FPM DECONT	Decontamination of Personnel and Equipment
FPM ENVID	Sample Identification, Handling, Transport and Storage of Contaminated Samples
FPM PIDETC	Operation of Field Analysers
FPM ENVSAMP	Sampling of Contaminated Soils

(source: Douglas Partners Field Procedures Manual)

Quality Control (QC) of the field programme was achieved by the following means:

- field replicate - a specific sample was split in the field, placed in separate containers and labelled with different sample numbers, and sent to the laboratory for analysis. Four intra-laboratory field replicates were tested.
- field equipment rinsate – one rinsate water samples was taken in the field during field investigations and sent to the laboratory at the completion of sampling to ensure decontamination of sampling equipment was adequate. A field equipment rinsate sample was collected from both the test bore sampling programme.

The field QC programme was undertaken in general accordance with the brief SAQP prepared for the site. Minor departures from the approved plan are discussed below.

Quality Control (QC) of the laboratory programme was achieved by the following means:

- Method blanks - the laboratory ran reagent blanks to confirm the equipment and standards used were uncontaminated.
- Laboratory duplicates - the laboratory split samples internally and conducted tests on separate extracts.
- Laboratory spikes - samples were spiked by the laboratory with a known concentration of contaminants and subsequently tested for percent recovery.
- Laboratory control sample – the laboratory prepares a standard reference material or a control matrix such as a blank sand or water fortified with analytes representative of the analyte class.
- Laboratory surrogates – the laboratory surrogate is prepared by adding a known amount of surrogate, which behaves similarly to the analyte, prior to analysis of each sample. The recovery result indicates the proportion of the known concentration of the surrogate detected during analysis.

Discussion

A. Field Replicates

The Relative Percent Difference (RPD) between duplicate results is used as a measure of laboratory reproducibility and is given by the following:-

$$RPD = \frac{ABS (\text{Duplicate result 1} - \text{Duplicate result 2})}{(\text{Duplicate result 1} + \text{Duplicate result 2}) / 2} \times 100$$

The RPD can have a value between 0% and 200%. An RPD data quality objective of up to 50% is generally considered to be acceptable for organic analysis, and 35% for inorganics (i.e. metals).

A summary of the results of the field soil replicate QA/QC testing is provided in Table F2.

Table F2 – Results of Field Soil Quality Control Analysis

Sample ID	Sample Depth	Sample type	Sampling Date	Heavy Metals								PAH				TRH				Benzene	Toluene	Ethylbenzene	Total Xylene	PCB ²	OCP ⁵	Asbestos
				As	Cd	Cr ¹	Cu	Pb	Hg	Ni	Zn	B(a)P	B(a)P TEQ	Naphthalene	total ²	F1 (C ₆ -C ₁₀)	F2 (>C ₁₀ -C ₁₆)	F3 (>C ₁₆ -C ₃₄)	F4 (>C ₃₄ -C ₄₀)							
1	1.2	N	13/01/2014	ND	ND	10	ND	4	ND	ND	1	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-
QA6 (1/1.2)		N	13/01/2014	ND	ND	5	ND	4	ND	ND	1	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-
RPD (%)				0	0	67	0	0	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A
10	0.5	F	13/01/2014	ND	ND	6	ND	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
QA5 (10/0.5)		F	13/01/2014	ND	ND	11	ND	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
RPD (%)				0	0	59	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N/A
13	1.0	F	9/01/2014	ND	ND	12	8	12	ND	5	23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
QA1 (13/1.0)		F	9/01/2014	5	ND	14	10	13	ND	6	29	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
RPD (%)				0	0	15	0	8	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N/A
14	0.1	F	14/01/2014	ND	ND	11	23	69	0.1	9	180	0.18	ND	ND	1.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
QA7 (14/0.1)		F	14/01/2014	ND	ND	10	25	85	ND	9	180	0.43	1	ND	3.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
RPD (%)				0	0	10	8	21	N/A	0	0	82	N/A	0	79	0	0	0	0	0	0	0	0	0	0	N/A
PQL				4	0.4	1	1	1	0.1	1	1	0.05	0.5	0.1	0.2	25	50	100	100	0.2	0.5	1	3	0.1	0.1	0.1g/kg

RPDs for the soil field replicates ranged from 0% to 67%, with the majority of the primary and replicate samples reporting results below the laboratory practical quantification limits (PQL) or within the acceptable limits. The chromium results from two of the replicate pairs reported marginally elevated RPDs that can generally be attributed to relatively low contaminant concentrations in soil for some analytes (ie. small differences in concentrations) resulting in a high RPD and the inherent heterogeneity of filling or surface soils encountered at the site. It is noted that the laboratories consider that any RPD is acceptable for laboratory duplicate results less than five times the PQL.

In all cases the primary and replicate sample results were significantly below the adopted SAC and with respect to the elevated RPDs, the higher of the two results was adopted for assessment purposes.

Notwithstanding the small number of elevated RPD results, the majority of the RPDs indicated a high level of precision or reproducibility and as such results were generally acceptable.

B. Field Rinsate Blank

One field equipment rinsate sample was tested as part of field investigations to check the adequacy of field decontamination procedures. In cases where sampling equipment was used, such as hand augers and trowels the equipment was decontaminated in accordance with field procedure "FPM DECONT".

The soil sampling field rinsate samples were tested for lead and a suite of petroleum hydrocarbons (TRH, BTEX and PAH). A summary of the results of the field rinsate QA/QC testing is provided in Table F3.

Table F3 – Results of Field Rinsate Analysis

Sample ID	Sampling Date	PAH					TRH				Benzene	Toluene	Ethylbenzene	Total Xylene
		Pb	B(a)P	B(a)P TEQ	Naphthalene	total ²	F1 (C ₆ -C ₁₀)	F2 (>C ₁₀ -C ₁₆)	F3 (>C ₁₆ -C ₃₄)	F4 (>C ₃₄ -C ₄₀)				
RB1	14/01/2014	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	PQL	30	1	5	1	1/5	10	50	100	100	1	1	1	1/2

Notes:

Results expressed in µg/L unless otherwise stated

Based on the decontamination procedure undertaken and the non-detect results reported it is considered unlikely that any significant cross-contamination occurred during the sampling. The results were generally acceptable.

C. Sample Handling and Holding Times

A review of the laboratory reports and chain of custody forms associated with the PSI indicates the following:

- Samples were received chilled and generally in good order;
- Samples received were appropriately preserved for all tests;
- VOC/SVOC samples were received in Teflon sealed containers;
- Volatile samples were received with zero headspace; and
- Samples were received within recommended holding times.

D. Laboratory Method Blanks

A reagent blank is prepared and analysed at the beginning of every analytical run, following calibration of the analytical apparatus. Results for reagent blanks for soil and water analyses showed concentrations of all analytes to be below laboratory PQL limits. Results are included in the laboratory reports attached in Appendix E.

E. Laboratory Duplicates

Four soil laboratory duplicate samples were tested during the soil testing programme for a select suite of analytes analysed during the laboratory programme. RPD for individual soil contaminants ranged from 0% to 67%, with results generally within the acceptable limits. A small number of marginally elevated RPDs were reported, however, these can be attributed to relatively low contaminant concentrations in soil for some analytes (i.e. small differences in concentrations) resulting in a high RPD or as noted by the laboratory the inhomogenous or non homogenous (sic) nature of the elements in the samples. Envirolab did however note that an acceptable recovery was obtained for the laboratory control sample. The soil laboratory duplicate results are therefore considered to be acceptable.

F. Laboratory Spikes

Recoveries in the order of 70% to 130% for inorganics and 60% to 140% for organics are generally considered to be acceptable. The average percentage recovery for individual contaminants in the Envirolab reports ranged from 66% to 130% which is generally within the quality control objectives. Overall, the results are therefore considered to be acceptable.

G. Laboratory Surrogate Recovery

This sample is prepared by adding a known amount of surrogate, which behaves similarly to the analyte, prior to analysis of each sample. The recovery result indicates the proportion of the known concentration of the surrogate detected during analysis. Surrogate recoveries were found to be generally within the laboratory acceptance limits, indicating that the extraction was effectively and appropriately completed.

CONCLUSIONS

In summary, while minor exceedances above the acceptance criteria were found for field replicates, laboratory duplicates and laboratory spikes the fact that the majority of exceedances occurred for analytes with low concentrations, the results are considered acceptable.

The accuracy and precision of the soil testing procedures, as inferred by the QA/QC data is generally considered to be of sufficient standard to allow the data reported to be used to interpret site contamination conditions. Table F4 summarises data quality indicators (DQIs).

Table F4 - Data Quality Indicators

DQI	Performance Indicator	Comment
Precision	Field replicate/duplicate set and calculation of relative percentage difference (RPD) Laboratory duplicates and calculation of RPDs Samples tested within recommended holding times	Yes (Refer to Section A & D)
Accuracy	Laboratory spikes and blanks Laboratory control samples (reference material)	Yes (Refer to Section D & F)
Representativeness	Laboratory blanks (assess false positives) Field blank sample (assess false positives) Review of laboratory and field and RPDs Use of appropriate field procedures	Yes (Refer to Section A, B, C & D)
Completeness	Use of standard field procedures (sample collection, preservation, handling and transport) Chain of custody (COC) documentation	Yes (Refer to the Section A and the COC attached to the laboratory reports)
Comparability	Number of sampling events and samplers Use of same standard field procedures Use of NATA accredited laboratory	Yes (Refer to Main report and QA/QC Section)

Appendix C – Borehole & Test Pit Logs

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Engineering Log - Borehole

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID. **BH1**

sheet: 1 of 2

project no. **SYDGE214942**

date started: **22 Feb 2018**

date completed: **22 Feb 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,756.31; N: 6,299,817.01 (MGA94)

surface elevation: 2.50 m (AHD)

angle from horizontal: 90°

drill model: Geoprobe 7822DT, Track mounted

drilling fluid: Water

hole diameter : 100 mm

drilling information						material substance						
method & support	1 penetration	2 water	3 samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetrometer (kPa) 100 200 300 400	structure and additional observations
PT <												

Engineering Log - Borehole

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID. **BH1**

sheet: 2 of 2

project no. **SYDGE214942**

date started: **22 Feb 2018**

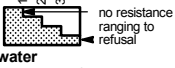
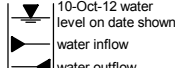
date completed: **22 Feb 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,756.31; N: 6,299,817.01 (MGA94) surface elevation: 2.50 m (AHD) angle from horizontal: 90°
drill model: Geoprobe 7822DT, Track mounted drilling fluid: Water hole diameter : 100 mm

drilling information						material substance								
method & support	penetration			water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
	1	2	3											
AD/T ↓				SPT 20, 30/50mm N*=R	-6		CL	Sandy CLAY: medium plasticity, pale grey, spotted red, with fine grained sand, trace of extremely weathered rock. <i>(continued)</i>	W	H	100 200 300 400	RESIDUAL SOIL		
					9.0			Borehole BH1 terminated at 8.70 m						
					-7									
					10.0									
					-8									
					11.0									
					-9									
					12.0									
					-10									
					13.0									
					-11									
					14.0									
					-12									
					15.0									
					-13									

method AD auger drilling* AS auger screwing* HA hand auger W washbore PT push tube * bit shown by suffix e.g. B blank bit T TC bit V V bit	support M mud N nil C casing penetration  water 	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet Wp plastic limit WI liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

Engineering Log - Borehole

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID. **BH2**

sheet: 1 of 2

project no. **SYDGE214942**

date started: **22 Feb 2018**

date completed: **23 Feb 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,719.85; N: 6,299,809.19 (MGA94)

surface elevation: 2.70 m (AHD)

angle from horizontal: 90°

drill model: Geoprobe 7822DT, Track mounted

drilling fluid: Water

hole diameter: 100 mm

drilling information					material substance							
method & support	1 penetration	2 water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetrometer (kPa) 100 200 300 400	structure and additional observations
PT			E	-2	1.0			FILL: Gravelly SAND: fine to medium grained, dark brown-black, with fine to medium angular gravel, trace of low to medium plasticity clay.	M			FILL PID: 3.7ppm
			E					FILL: SAND: fine to medium grained, brown-dark brown, trace of silt and fine gravel.	M			PID: 3.8ppm
			E					PID: 6.5ppm				
			SPT 3, 1, 1 N*=2	-1	2.0		SC	CLAYEY SAND: fine grained, grey, medium plasticity clay, organic odour, trace of organics and root fibres.	M - W	VL	ALLUVIUM	
			E					PID: 4.9ppm				
			SPT 3, 5, 4 N*=9					-0	3.0		CH	Silty CLAY: medium to high plasticity, pale grey-dark grey, trace of root fibres and fine white gravel.
			E									
			SPT 2, 4, 7 N*=11	-2	4.0		CH					Silty CLAY: medium to high plasticity, grey mottled orange-red, trace of fine grained sand, root fibres and fine pale gravel.
SPT 2, 4, 7 N*=11	-3	5.0		CL	Sandy CLAY: medium to high plasticity, pale grey, white sotted orange, with fine grained sand, trace of root fibres and silt.			RESIDUAL SOIL				
SPT 18, 21, 30 N*=51	-4	6.0		SC	SAND: fine grained, pale grey, streaked red, medium plasticity clay.		H					
	-5	7.0										

method AD auger drilling* AS auger screwing* HA hand auger W washbore PT push tube * bit shown by suffix e.g. B blank bit T TC bit V V bit	support M mud C casing penetration 	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet Wp plastic limit WL liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

Engineering Log - Borehole

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID. **BH2**

sheet: 2 of 2

project no. **SYDGE214942**

date started: **22 Feb 2018**

date completed: **23 Feb 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,719.85; N: 6,299,809.19 (MGA94)

surface elevation: 2.70 m (AHD)

angle from horizontal: 90°

drill model: Geoprobe 7822DT, Track mounted

drilling fluid: Water

hole diameter : 100 mm

drilling information					material substance																
method & support	1 penetration	3 water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetrometer (kPa) 100 200 300 400	structure and additional observations									
PT			SPT 20, 30 N*=R	-6	9.0		CL	Sandy CLAY: medium to high plasticity, orange-brown mottled red, pale grey, fine to medium grained sand.	M	H		RESIDUAL SOIL									
				-7	10.0		CH	CLAY: high plasticity, pale grey, spotted brown, trace of fine to coarse gravel. 10.5 to 11.2 m: very soft spot encountered	F - St												
				-8	11.0		SC	CLAYEY SAND: fine to coarse grained, pale brown-orange mottled pale grey, with medium plasticity clay. 11.9 m: hard material encountered	H												
				-9	12.0		CL	Silty CLAY: medium to high plasticity, pale grey mottled pale brown, with silt, trace of fine sub-rounded grey gravel, medium strength.	St - VSt												
				-10	13.0					SC	CLAYEY SAND: fine to medium grained, pale grey, with medium plasticity clay, trace of sandstone. 13.05 to 13.4 m: soft material SAND: fine to coarse grained, pale brown-orange, trace of sandstone.		H								
				-11	14.0					SC											
				-12	15.0		Borehole BH2 terminated at 15.06 m														
				-13																	
				method AD auger drilling* AS auger screwing* HA hand auger W washbore PT push tube				support M mud N nil C casing					samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing				classification symbol & soil description based on Unified Classification System		consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense		
				penetration no resistance ranging to refusal				water 10-Oct-12 water level on date shown ▲ water inflow ▼ water outflow					moisture D dry M moist W wet Wp plastic limit WL liquid limit								
* bit shown by suffix e.g. AD/T B blank bit T TC bit V V hit																					

Engineering Log - Borehole

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID: **BH3**

sheet: 1 of 3

project no: **SYDGE214942**

date started: **23 Feb 2018**

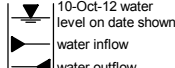
date completed: **23 Feb 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,755.46; N: 6,299,767.29 (MGA94) surface elevation: 4.00 m (AHD) angle from horizontal: 90°
drill model: Geoprobe 7822DT, Track mounted drilling fluid: Water hole diameter : 100 mm

drilling information					material substance									
method & support	penetration			water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
PT	1	2	3						ML	TOPSOIL: Silty CLAY : low to medium plasticity, brown, pale brown, trace of organics and root fibres.	D - M		100 200 300 400	TOPSOIL
				E						0.8 m: grading to brown-dark brown				
				SPT 4, 5, 7 N*=12		3	1.0		SC	CLAYEY SAND : fine to medium grained, dark brown, trace of fine grained sand.		MD		ALLUVIUM
				E										
				SPT 4, 6, 7 N*=13		2	2.0		CH	CLAY : medium to high plasticity, dark brown mottled red-dark grey.	M	St		RESIDUAL SOIL
				E										
				E										
				SPT 3, 5, 6 N*=11		1	3.0		CL CH CH	Sandy CLAY : medium to high plasticity, dark brown, grading to brown, pale brown, fine to medium grained sand, trace of silt. CLAY : medium to high plasticity, pale grey, white, trace of silt, sand and root fibres. CLAY : medium to high plasticity, pale grey, white, trace of tree root fibres. 3.2 m: colour changes to pale grey spotted red				
				SPT 2, 4, 6 N*=10		0	4.0				4.1 m: colour changes to pale, more tree root fibres present			
AD/T														
				SPT 5, 8, 13 N*=21		-2	6.0			5.9 m: grading red-orange		VSt H		
					-3	7.0			Borehole BH3 continued as cored hole					

method AD auger drilling* AS auger screwing* HA hand auger W washbore PT push tube		support M mud C casing N nil		samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing		classification symbol & soil description based on Unified Classification System		consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense	
penetration  no resistance ranging to refusal		water 10-Oct-12 water level on date shown  water inflow water outflow		moisture D dry M moist W wet Wp plastic limit WI liquid limit					

* bit shown by suffix
e.g.
AD/T
B blank bit
T TC bit
V V bit

Engineering Log - Cored Borehole

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID. **BH3**

sheet: 2 of 3

project no. **SYDGE214942**

date started: **23 Feb 2018**

date completed: **23 Feb 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,755.46; N: 6,299,767.29 (MGA94)

surface elevation: 4.00 m (AHD)

angle from horizontal: 90°

drill model: Geoprobe 7822DT, Track mounted

drilling fluid: Water

hole diameter : 100 mm

vane id.:

drilling information				material substance			rock mass defects											
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 X = axial; O = diametral a = axial; d = diametral				samples, field tests & Is(50) (MPa)	core run & RQD	defect spacing (mm)				additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)	
							VL	L	M	H			FH	30	100	300	1000	3000
		4																
			3															
			2															
			1															
			0															
			-1															
			-2															
					started coring at 6.70m													
			-3		SANDSTONE: fine grained, orange-red stained brown-grey, laminated, iron staining present. 7.00 m: colour changes to pale grey-white, with iron stains	XW					a=0.47 d=0.05	13%				JT, 45°, PL, RO, CO SM, PL, SO, CO, 30 mm		
					SANDSTONE: fine grained, pale grey-grey, bedded, trace of iron stains.	DW					a=1.62 d=1.56	84%				JT, 85°, IR, RO, CO - Fe		
method & support AS auger screwing AD auger drilling CB claw or blade bit W washbore NMLCNMLC core (51.9 mm) NQ wireline core (47.6mm) HQ wireline core (63.5mm) PQ wireline core (85.0mm) SPT standard penetration test PT push tube				water 10/10/12, water level on date shown water inflow complete drilling fluid loss partial drilling fluid loss 25uL water pressure test result (lugeons) for depth interval shown		graphic log / core recovery core recovered (graphic symbols indicate material) no core recovered core run & RQD barrel withdrawn RQD = Rock Quality Designation (%)			weathering & alteration* RS residual soil XW extremely weathered HW highly weathered DW distinctly weathered MW moderately weathered SW slightly weathered FR fresh *W replaced with A for alteration strength VL very low L low M medium H high VH very high FH extremely high				defect type PT parting JT joint SZ shear zone SS shear surface CO contact CS crushed seam SM seam roughness SL slickensided POL polished SO smooth RO rough VR very rough				planarity PL planar CU curved UN undulating ST stepped IR Irregular coating CN clean SN stain VN veneer CO coating	

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID. **BH3**

sheet: 3 of 3

project no. **SYDGE214942**

date started: **23 Feb 2018**

date completed: **23 Feb 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,755.46; N: 6,299,767.29 (MGA94)

surface elevation: 4.00 m (AHD)

angle from horizontal: 90°

drill model: Geoprobe 7822DT, Track mounted

drilling fluid: Water

hole diameter : 100 mm

vane id.:

drilling information				material substance		rock mass defects						
method & support	water	RL (m)	depth (m)	graphic log	material description	weathering & alteration	estimated strength & Is(50)	samples, field tests & Is(50) (MPa)	core run & RQD	defect spacing (mm)	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)	
					ROCK TYPE: grain characteristics, colour, structure, minor components						particular	general
method & support AS auger screwing AD auger drilling CB claw or blade bit W washbore NMLCNMLC core (51.9 mm) NQ wireline core (47.6mm) HQ wireline core (63.5mm) PQ wireline core (85.0mm) SPT standard penetration test PT push tube	water 10/10/12, water level on date shown water inflow complete drilling fluid loss partial drilling fluid loss 25uL water pressure test result (lugeons) for depth interval shown	Not Encountered	9.0 10.0 11.0 12.0 13.0 14.0 15.0		SANDSTONE: fine grained, pale grey-grey, bedded, trace of iron stains. (continued)	SW		a=2.22 d=1.86 a=1.73 d=2.05 a=2.10 d=1.50 a=1.24 d=0.77 a=1.71 d=1.40 a=0.45 d=0.06 a=0.84 d=0.50 a=1.37 d=0.94	84% <			

Engineering Log - Borehole

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID: **BH4**

sheet: 1 of 3

project no: **SYDGE214942**

date started: **27 Feb 2018**

date completed: **27 Feb 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,707.00; N: 6,299,886.00 (MGA94) surface elevation: 2.80 m (AHD) angle from horizontal: 90°
drill model: Geoprobe 7822DT, Track mounted drilling fluid: Water hole diameter : 100 mm

drilling information					material substance									
method & support	penetration			water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
PT 														

method AD auger drilling* AS auger screwing* HA hand auger W washbore PT push tube * bit shown by suffix e.g. B blank bit T TC bit V V bit	support M mud C casing penetration 	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet Wp plastic limit WL liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

Engineering Log - Borehole

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID. **BH4**

sheet: 2 of 3

project no. **SYDGE214942**

date started: **27 Feb 2018**

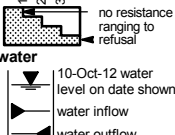
date completed: **27 Feb 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,707.00; N: 6,299,886.00 (MGA94) surface elevation: 2.80 m (AHD) angle from horizontal: 90°
drill model: Geoprobe 7822DT, Track mounted drilling fluid: Water hole diameter : 100 mm

drilling information							material substance							
method & support	penetration			water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
↓ W	1	2	3						CL	Sandy CLAY: medium to high plasticity, grey mottled dark red-orange, iron stained, with fine to medium grained sand, trace of silt. <i>(continued)</i>	M	F - St	100	RESIDUAL SOIL
				SPT 3, 3, 6 N*=9	-6	9.0							8.7 m: colour changes to pale grey mottled red-orange	
							-7						200	
							-8						300	
					SPT 5, 7, 11 N*=18		-9			11.2 m: ground gets harder		VSt - H	400	
							-10							
					SPT 11, 14, 20 N*=34		-11							
							-12							
							-13							
										Borehole BH4 continued as cored hole				
						</								

method AD auger drilling* AS auger screwing* HA hand auger W washbore PT push tube * bit shown by suffix e.g. B blank bit T TC bit V V bit	support M mud C casing penetration 	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear, peak/remoulded (kPa) R refusal HB hammer bouncing	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet Wp plastic limit WL liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

Engineering Log - Cored Borehole

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID. **BH4**

sheet: 3 of 3

project no. **SYDGE214942**

date started: **27 Feb 2018**

date completed: **27 Feb 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,707.00; N: 6,299,886.00 (MGA94)

surface elevation: 2.80 m (AHD)

angle from horizontal: 90°

drill model: Geoprobe 7822DT, Track mounted

drilling fluid: Water

hole diameter : 100 mm

vane id.:

drilling information				material substance				rock mass defects											
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	estimated strength & Is(50)					samples, field tests & Is(50) (MPa)	core run & RQD	defect spacing (mm)				additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)	
							VL	L	M	H	VH			30	100	300	1000	3000	particular
			-6																
			-7																
			-8																
			-9																
			-10																
			-11		started coring at 13.20m														
			-12		SANDSTONE: fine grained, pale grey, iron stained, interbedded with extremely weathered sandstone.	DW											JT, 85°, PL, CN		
			-13			XW													
			-14		NO CORE: 0.15 m	DW													
			-15		SANDSTONE: fine grained, pale grey, iron stained, interbedded with extremely weathered sandstone.	XW											PT, 0°, PL, SO - RO, CN		
			-16		NO CORE: 0.21 m												PT, 0°, PL, SO - RO, CN		
			-17		SANDSTONE: fine grained, pale grey, iron stained, orange, bedded.												PT, 0 - 5°, PL, SO - RO, CN - SN		
			-18		Borehole BH4 terminated at 15.00 m														
			-19																
method & support AS auger screwing AD auger drilling CB claw or blade bit W washbore NMLCNMLC core (51.9 mm) NQ wireline core (47.6mm) HQ wireline core (63.5mm) PQ wireline core (85.0mm) SPT standard penetration test PT push tube				water 10/10/12, water level on date shown water inflow complete drilling fluid loss partial drilling fluid loss 25uL water pressure test result (lugeons) for depth interval shown		graphic log / core recovery core recovered (graphic symbols indicate material) no core recovered core run & RQD barrel withdrawn RQD = Rock Quality Designation (%)				weathering & alteration* RS residual soil XW extremely weathered HW highly weathered DW distinctly weathered MW moderately weathered SW slightly weathered FR fresh *W replaced with A for alteration strength VL very low L low M medium H high VH very high FH extremely high				defect type PT parting JT joint SZ shear zone SS shear surface CO contact CS crushed seam SM seam roughness SL slickensided POL polished SO smooth RO rough VR very rough planarity PL planar CU curved UN undulating ST stepped IR irregular coating CN clean SN stain VN veneer CO coating					

Engineering Log - Borehole

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID. **BH5**

sheet: 1 of 3

project no. **SYDGE214942**

date started: **28 Feb 2018**

date completed: **28 Feb 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,711.00; N: 6,299,825.00 (MGA94) surface elevation: 2.70 m (AHD) angle from horizontal: 90°
drill model: Geoprobe 7822DT, Track mounted drilling fluid: Water hole diameter: 100 mm

drilling information				material substance					
method & support	penetration	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density
1 2 3							FILL: Gravely SILTY SAND: fine to coarse grained, brown-red, trace ceramics fragments.	M	
				2.0		CL	Sandy CLAY: medium to high plasticity, grey-brown, trace of organics with fine to coarse grained sand.	S	
		SPT 3, 2, 1 N*=3		1.0					
				1.0		CH	Silty CLAY: medium to high plasticity, dark brown-black, trace of root fibres.		
				2.0					
				3.0		SC	CLAYEY SAND: fine to coarse grained, pale grey, medium to high plasticity clay.	W	L
		SPT 1, 2, 3 N*=5		3.0					
				4.0		CL	Sandy CLAY: medium to high plasticity, grey mottled orange.	St	
		SPT 2, 5, 6 N*=11		4.0					
				5.0					
				6.0		CH	5.4 m: colour change to red mottled orange-grey CLAY: medium to high plasticity, grey-pale grey, spotted orange, trace of silt and fine grained sand.		
		SPT 3, 3, 7 N*=10		6.0					
				7.0					
				8.0					
		SPT 6, 8, 10 N*=18		8.0					
				9.0					
				10.0					
				11.0					
				12.0					
				13.0					
				14.0					
				15.0					
				16.0					
				17.0					
				18.0					
				19.0					
				20.0					
				21.0					
				22.0					
				23.0					
				24.0					
				25.0					
				26.0					
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				89.0					
				90.0					
				91.0					
				92.0					
				93.0					
				94.0					
				95.0					
				96.0					
				97.0					
				98.0					
				99.0					
				100.0					

method AD auger drilling* AS auger screwing* HA hand auger W washbore PT push tube * bit shown by suffix e.g. B blank bit T TC bit V V bit	support M mud C casing penetration 	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet Wp plastic limit WL liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

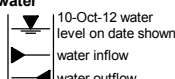
Engineering Log - Borehole

Borehole ID. **BH5**
 sheet: 2 of 3
 project no. **SYDGE214942**
 date started: **28 Feb 2018**
 date completed: **28 Feb 2018**
 logged by: **LP**
 checked by: **AM**

client: **St Hilliers**
 principal:
 project: **Geotechnical and Environmental Assessment**
 location: **32 Mann Street, Gosford, NSW**

position: E: 345,711.00; N: 6,299,825.00 (MGA94) surface elevation: 2.70 m (AHD) angle from horizontal: 90°
 drill model: Geoprobe 7822DT, Track mounted drilling fluid: Water hole diameter : 100 mm

drilling information						material substance								
method & support	penetration			water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
W	1	2	3						CH	CLAY: medium to high plasticity, grey-pale grey, spotted orange, trace of silt and fine grained sand. <i>(continued)</i>	W	VSt - H	100	RESIDUAL SOIL
							200						300	
					SPT 6, 7, 13 N*=20	-6	9.0			9.3 m: started getting really hard				
						-7	10.0			Borehole BH5 continued as cored hole				
						-8	11.0							
						-9	12.0							
						-10	13.0							
						-11	14.0							
						-12	15.0							
						-13								

method AD auger drilling* AS auger screwing* HA hand auger W washbore PT push tube * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	support M mud C casing penetration  water 	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet Wp plastic limit WI liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

Engineering Log - Cored Borehole

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID. **BH5**

sheet: 3 of 3

project no. **SYDGE214942**

date started: **28 Feb 2018**

date completed: **28 Feb 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,711.00; N: 6,299,825.00 (MGA94)

surface elevation: 2.70 m (AHD)

angle from horizontal: 90°

drill model: Geoprobe 7822DT, Track mounted

drilling fluid: Water

hole diameter : 100 mm

vane id.:

drilling information				material substance			rock mass defects					
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	estimated strength & Is(50) X = axial; O = diametral a = axial; d = diametral	samples, field tests & Is(50) (MPa)	core run & RQD	defect spacing (mm)	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)	
											particular	general
			-6									
			-9.0									
			-7		started coring at 9.40m							
			-10.0		SANDSTONE: fine to coarse grained, red, iron stained, bedded, trace of fine gravel (quartz).	XW		a=0.61 d=0.61	84%		PT, 0°, PL, RO, CN JT, 20°, UN, RO, CN SM, 0°, PL, SO, CO, 100 mm SM, 0°, PL, SO, CO, 30 mm	
			-8									
			-11.0		SANDSTONE: fine to medium grained, pale grey, laminated orange-red.	DW		a=0.65 d=0.95			PT, 0°, UN, RO, CN CS, 0°, PL, RO, CO PT, 5°, UN, RO, CN PT, 0°, CU, SO, CN PT, 0°, CU, SO, CN	
			-9		SANDSTONE: fine to medium grained, grey, bedded.	SW		a=0.35 d=0.07			PT, 0°, UN, SO, CN	
			-12.0									
			-10		NO CORE: 0.35 m							
			-13.0		SANDSTONE: fine to medium grained, red-orange.	XW		a=0.49 d=0.38			PT, 3°, UN, SO, SN JT, 60°, PL, RO, CN, 130 mm	
			-11									
			-14.0		SANDSTONE: fine grained, grey, bedded.	SW					JT, 75°, UN, RO, CN, 120 mm Fractured zone JT, 75°, PL, SO, SN, 130 mm SM, 0°, PL, SO, CO, 60 mm	
			-12		SANDSTONE: dark grey, interbedded sandstone.			a=0.58 d=0.10	12%		PT, 0 - 5°, UN - IR, RO, CN SM, 0°, PL, SO, CO, 20 mm	
			-15.0		Borehole BH5 terminated at 15.00 m			a=0.52 d=0.43			SM, 0°, PL, SO, CO, 30 mm	
			-13									
method & support AS auger screwing AD auger drilling CB claw or blade bit W washbore NMLCNMLC core (51.9 mm) NQ wireline core (47.6mm) HQ wireline core (63.5mm) PQ wireline core (85.0mm) SPT standard penetration test PT push tube				water 10/10/12, water level on date shown water inflow complete drilling fluid loss partial drilling fluid loss 25uL water pressure test result (lugeons) for depth interval shown		graphic log / core recovery core recovered (graphic symbols indicate material) no core recovered core run & RQD barrel withdrawn RQD = Rock Quality Designation (%)		weathering & alteration* RS residual soil XW extremely weathered HW highly weathered DW distinctly weathered MW moderately weathered SW slightly weathered FR fresh *W replaced with A for alteration strength VL very low L low M medium H high VH very high EH extremely high		defect type PT parting JT joint SZ shear zone SS shear surface CO contact CS crushed seam SM seam roughness SL slickensided POL polished SO smooth RO rough VR very rough planarity PL planar CU curved UN undulating ST stepped IR Irregular coating CN clean SN stain VN veneer CO coating		

Engineering Log - Borehole

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID. **BH6**

sheet: 1 of 3

project no. **SYDGE214942**

date started: **01 Mar 2018**

date completed: **01 Mar 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,761.69; N: 6,299,796.39 (MGA94)

surface elevation: 4.00 m (AHD)

angle from horizontal: 90°

drill model: Geoprobe 7822DT, Track mounted

drilling fluid: Water

hole diameter: 100 mm

drilling information					material substance							
method & support	1 penetration	2 water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
PT CASING AD/T W	1		E	RL				TOPSOIL: SILTY SAND: fine to medium grained, brown-pale brown, trace of organics (root fibres).	M	L	100 200 300 400	TOPSOIL PID: 0.0ppm
	2						SP	SILTY SAND: fine to medium grained, dark brown-black, trace of low plasticity clay and root fibres.				ALLUVIUM
	3		E		1.0							PID: 1.3ppm
			SPT 3, 3, 3 N*=6									
			E				CL	Sandy CLAY: medium to high plasticity, grey-brown, with fine grained sand, trace of silt.		VS		PID: 1.0ppm
					2.0							
			E									PID: 2.2ppm
							CH	2.6 m: clay to sand ratio increases				
			SPT 5, 8, 10 N*=18		3.0			CLAY: high plasticity, grey, with fine grained sand, trace of tree root fibres.		VSt		RESIDUAL SOIL
									M			
					4.0							
		SPT 5, 7, 9 N*=16										
					5.0		CH	Silty CLAY: medium plasticity, pale grey-white mottled red-orange, trace of sand (iron stained).		H		
					6.0							
		SPT 5, 10, 15 N*=25										
				-3	7.0			Borehole BH6 continued as cored hole				

method AD auger drilling* AS auger screwing* HA hand auger W washbore PT push tube * bit shown by suffix e.g. B blank bit T TC bit V V bit	support M mud C casing penetration water 10-Oct-12 water level on date shown water inflow water outflow	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet Wp plastic limit WI liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

Engineering Log - Cored Borehole

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID. **BH6**

sheet: 2 of 4

project no. **SYDGE214942**

date started: **01 Mar 2018**

date completed: **01 Mar 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,761.69; N: 6,299,796.39 (MGA94)				surface elevation: 4.00 m (AHD)				angle from horizontal: 90°															
drill model: Geoprobe 7822DT, Track mounted				drilling fluid: Water				hole diameter : 100 mm				vane id.:											
drilling information				material substance								rock mass defects											
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	estimated strength & Is50					samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm)				additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)					
							VL	J	H	M	VH			FH	30	100	300	1000	3000	particular	general		
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral	core run & RQD	30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
							VL	J	H	M	VH	FH			30	100	300	1000	3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)			
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	VL	J	H	M	VH	FH	samples, field tests & Is(50) (MPa) (MPa) a = axial; d = diametral										

Engineering Log - Cored Borehole

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID. **BH6**

sheet: 3 of 4

project no. **SYDGE214942**

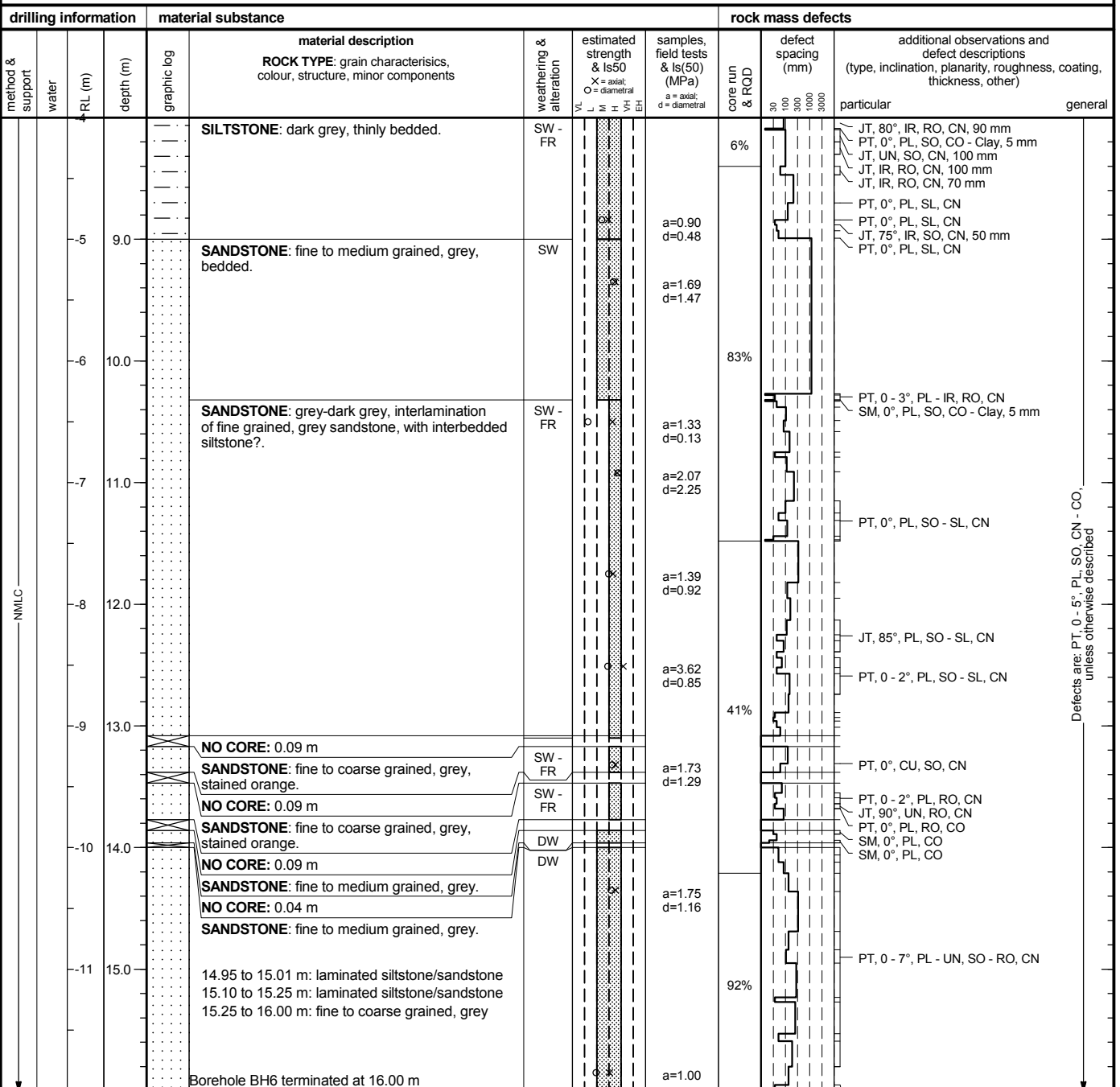
date started: **01 Mar 2018**

date completed: **01 Mar 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,761.69; N: 6,299,796.39 (MGA94) surface elevation: 4.00 m (AHD) angle from horizontal: 90°
drill model: Geoprobe 7822DT, Track mounted drilling fluid: Water hole diameter: 100 mm vane id.:



method & support AS auger screwing AD auger drilling CB claw or blade bit W washbore NMLCNMLC core (51.9 mm) NQ wireline core (47.6mm) HQ wireline core (63.5mm) PQ wireline core (85.0mm) SPT standard penetration test PT push tube	water 10/10/12, water level on date shown water inflow complete drilling fluid loss partial drilling fluid loss water pressure test result (lugeons) for depth interval shown	graphic log / core recovery core recovered (graphic symbols indicate material) no core recovered core run & RQD barrel withdrawn RQD = Rock Quality Designation (%)	weathering & alteration* RS residual soil XW extremely weathered HW highly weathered DW distinctly weathered MW moderately weathered SW slightly weathered FR fresh *W replaced with A for alteration strength VL very low L low M medium H high VH very high EH extremely high	defect type PT parting JT joint SZ shear zone SS shear surface CO contact CS crushed seam SM seam roughness SL slickensided POL polished SO smooth RO rough VR very rough	planarity PL planar CU curved UN undulating ST stepped IR irregular coating CN clean SN stain VN veneer CO coating

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID. **BH6**

sheet: 4 of 4

project no. **SYDGE214942**date started: **01 Mar 2018**

date completed: **01 Mar 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,761.69; N: 6,299,796.39 (MGA94)				surface elevation: 4.00 m (AHD)				angle from horizontal: 90°											
drill model: Geoprobe 7822DT, Track mounted				drilling fluid: Water				hole diameter : 100 mm				vane id.:							
drilling information				material substance						rock mass defects									
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	estimated strength & Is50					samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm)				additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)	
							VL	L	M	H	FH			30	100	300	1000	3000	particular
		-13	17.0								d=0.28						SM, 7°, UN, SO, CO, 3 mm		
		-14	18.0														SM, 5°, UN, SO, CO, 1 mm		
		-15	19.0																
		-16	20.0																
		-17	21.0																
		-18	22.0																
		-19	23.0																
method & support AS auger screwing AD auger drilling CB claw or blade bit W washbore NMLCNMLC core (51.9 mm) NQ wireline core (47.6mm) HQ wireline core (63.5mm) PQ wireline core (85.0mm) SPT standard penetration test PT push tube				water 10/10/12, water level on date shown water inflow complete drilling fluid loss partial drilling fluid loss water pressure test result (lugeons) for depth interval shown 25uL				graphic log / core recovery core recovered (graphic symbols indicate material) no core recovered core run & RQD barrel withdrawn RQD = Rock Quality Designation (%)				weathering & alteration* RS residual soil XW extremely weathered HW highly weathered DW distinctly weathered MW moderately weathered SW slightly weathered FR fresh *W replaced with A for alteration strength VL very low L low M medium H high VH very high FH extremely high				defect type PT parting JT joint SZ shear zone SS shear surface CO contact CS crushed seam SM seam roughness SL slickensided POL polished SO smooth RO rough VR very rough planarity PL planar CU curved UN undulating ST stepped IR Irregular coating CN clean SN stain VN veneer CO coating			

Engineering Log - Borehole

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID. **BH7**

sheet: 1 of 3

project no. **SYDGE214942**

date started: **02 Mar 2018**

date completed: **02 Mar 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,710.50; N: 6,299,759.90 (MGA94) surface elevation: 2.50 m (AHD) angle from horizontal: 90°
drill model: Geoprobe 7822DT, Track mounted drilling fluid: Water hole diameter : 100 mm

drilling information					material substance							
method & support	1 penetration	2 water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetrometer (kPa) 100 200 300 400	structure and additional observations
PT			E					FILL: Gravelly SAND: fine to coarse grained, dark brown, fine to medium angular gravel, trace of clay and ceramics.	M			FILL PID: 2.5ppm
				2				FILL: Gravelly SAND: fine to coarse grained, pale brown-orange, medium to coarse angular gravel.				
			SPT 2, 1, 1 N*=2		1.0		CL	Sandy CLAY: medium to high plasticity, dark brown, with fine grained sand, trace of silt.		VS		ALLUVIUM
			E	1								PID: 1.6ppm
			SPT 1, 1, 4 N*=5		2.0		SC CL	SAND: fine to medium grained, grey, trace of low to medium plasticity clay. Sandy CLAY: medium to high plasticity, grey, with fine to medium grained sand, trace of silt, root fibres and organics. 2.5 m: colour change to grey mottled red-orange	W	VL F		RESIDUAL SOIL
			E	0								PID: 2.2ppm
			E									PID: 1.5ppm
			SPT 2, 3, 3 N*=6		3.0		CH	CLAY: medium to high plasticity, grey, mottled orange, red.	M			
				-1								
			SPT 3, 3, 4 N*=7		4.0							
AD/T												
			SPT 9, 10, 16, N*=26		5.0		CL	Sandy CLAY: low plasticity, pale grey-white mottled red-orange, fine to coarse grained sand, trace of extremely weathered ironstone gravel.		St - VSt		
				-3								
	</											

method AD auger drilling* AS auger screwing* HA hand auger W washbore PT push tube * bit shown by suffix e.g. B blank bit T TC bit V V bit	support M mud C casing penetration water 10-Oct-12 water level on date shown water inflow water outflow	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet Wp plastic limit WL liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

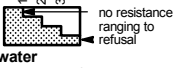
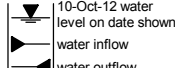
Engineering Log - Borehole

Borehole ID. **BH7**
sheet: 2 of 3
project no. **SYDGE214942**
date started: **02 Mar 2018**
date completed: **02 Mar 2018**
logged by: **LP**
checked by: **AM**

client: **St Hilliers**
principal:
project: **Geotechnical and Environmental Assessment**
location: **32 Mann Street, Gosford, NSW**

position: E: 345,710.50; N: 6,299,759.90 (MGA94) surface elevation: 2.50 m (AHD) angle from horizontal: 90°
drill model: Geoprobe 7822DT, Track mounted drilling fluid: Water hole diameter : 100 mm

drilling information						material substance								
method & support	penetration			water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
AD/T	1	2	3						CL	Sandy CLAY: low plasticity, pale grey-white mottled red-orange, fine to coarse grained sand, trace of extremely weathered ironstone gravel. <i>(continued)</i>	M	H	100 200 300 400	RESIDUAL SOIL
						-6				Borehole BH7 continued as cored hole				
							9.0							
						-7								
							10.0							
						-8								
							11.0							
						-9								
							12.0							
						-10								
							13.0							
						-11								
							14.0							
						-12								
							15.0							
						-13								

method AD auger drilling* AS auger screwing* HA hand auger W washbore PT push tube * bit shown by suffix e.g. B blank bit T TC bit V V bit	support M mud N nil C casing penetration  water 	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet Wp plastic limit WI liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

Engineering Log - Cored Borehole

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID. **BH7**

sheet: 3 of 3

project no. **SYDGE214942**

date started: **02 Mar 2018**

date completed: **02 Mar 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,710.50; N: 6,299,759.90 (MGA94)

surface elevation: 2.50 m (AHD)

angle from horizontal: 90°

drill model: Geoprobe 7822DT. Track mounted

drilling fluid: Water

hole diameter : 100 mm

vane id.:

drilling information				material substance		rock mass defects								
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	estimated strength & Is(50)		samples, field tests & Is(50) (MPa)	core run & RQD	defect spacing (mm)	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)	particular	general
							a = axial; O = diametral	a = axial; d = diametral						
			-6		started coring at 8.60m									
NMLC			9.0		SANDSTONE: fine grained, pale grey, iron stained, interbedded with dark grey siltstone.	SW			a=0.63 d=0.61			PT, 0°, IR, RO, CN, 10 mm PT, 0°, PL, RO, CN PT, 0°, PL, SL, CN		
			-7		SILTSTONE: dark grey, iron stained, interbedded with dark grey sandstone.				a=2.32 d=1.66			PT, 0°, IR, RO, CO - Clay PT, 0°, PL, SL, CN JT, 87 - 90°, PL, SO, CN PT, 0 - 5°, PL - UN, SO - RO, CN CS, 0°, PL, SO, 20 mm		
			10.0		SANDSTONE: fine grained, pale grey, iron stained, bedded.					69%				
			-8									PT, 0 - 5°, PL - UN, SO - SL, CN		
			11.0						a=0.56 d=0.59			PT, 0 - 5°, PL - UN, SO, CN PT, 0 - 5°, PL - UN, SO, CN		
			-9		SANDSTONE: fine to coarse grained, pale grey, iron stained, massive, trace of gravel.				a=1.18 d=1.58 a=1.49 d=1.53			SM, 0°, PL, SO, CO		
			12.0											
			-10											
			13.0		SILTSTONE: dark grey, interlaminated with fine grained sandstone. SANDSTONE: fine to coarse grained, pale grey, highly iron stained bedded.	FR			a=1.91 d=1.32	83%		JT, 75°, IR, SO - RO, CN		
			-11											
		14.0						a=1.20 d=1.84						
		-12				HW								
		15.0						a=0.97 d=0.99 a=1.19 d=1.56	100%		PT, 0 - 7°, IR, SO - RO, CN			
		-13			Borehole BH7 terminated at 15.20 m									

method & support

AS auger screwing
AD auger drilling
CB claw or blade bit
W washbore
NMLCNMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)
SPT standard penetration test
PT push tube

water

10/10/12, water level on date shown

water inflow

complete drilling fluid loss

partial drilling fluid loss

25uL

water pressure test result (lugeons) for depth interval shown

graphic log / core recovery

core recovered (graphic symbols indicate material)

no core recovered

core run & RQD

barrel withdrawn

RQD = Rock Quality Designation (%)

weathering & alteration*

RS residual soil
XW extremely weathered
HW highly weathered
DW distinctly weathered
MW moderately weathered
SW slightly weathered
FR fresh
*W replaced with A for alteration

strength

VL very low
L low
M medium
H high
VH very high
FH extremely high

defect type

PT parting
JT joint
SZ shear zone
SS shear surface
CO contact
CS crushed seam
SM seam

planarity

PL planar
CU curved
UN undulating
ST stepped
IR irregular

roughness

SL slickensided
POL polished
SO smooth
RO rough
VR very rough

coating

CN clean
SN stain
VN veneer
CO coating

Defects are: PT, 0 - 5° PL, SO, CN, unless otherwise described

Engineering Log - Borehole

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID. **BH8**

sheet: 1 of 2

project no. **SYDGE214942**

date started: **06 Mar 2018**

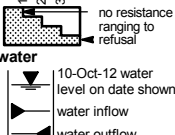
date completed: **06 Mar 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,745.57; N: 6,299,797.53 (MGA94) surface elevation: 2.50 m (AHD) angle from horizontal: 90°
drill model: Geoprobe 7822DT, Track mounted drilling fluid: Water hole diameter : 100 mm

drilling information					material substance							
method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
PT ADIT	1 2 3							ASPHALT.	M	L - MD		FILL PID: 1.5ppm ALLUVIUM PID: 0.3ppm PID: 0.6ppm
				-2		CH	FILL: Gravelly SAND: fine to coarse grained, dark brown, with fine to medium gravel, trace of ceramics. Silty CLAY: medium to high plasticity, dark brown, trace of sand and organics (root fibres).	F				
				1.0		SP	SILTY SAND: fine to coarse grained, grey, low to medium plasticity clay, trace of organics (root fibres).	L				
					-1				W	St		RESIDUAL SOIL PID: 1.3ppm
			SPT 2, 2, 7 N*=9	0		CL	Sandy CLAY: medium to high plasticity, grey mottled dark red-orange, with fine to coarse grained sand, trace ironstone.					
				2.0								
				-2				M	VSt			
			SPT 4, 7, 9 N*=16	4.0		CL	Silty CLAY: medium plasticity, pale grey-white, trace of fine sun-rounded gravel.					
				5.0								
				-3				CL	H			
		SPT 10, 16, 15 N*=31	6.0			Silty CLAY: medium to high plasticity, brown-orange, with fine sand.						
			7.0			6.4 to 6.5 m: ground gets soft						
				-5			SC	CLAYEY SAND: fine to medium grained, brown-orange, with low to medium plasticity clay, trace of weathered sandstone.				
			SPT 30, 30, N*=R									

method AD auger drilling* AS auger screwing* HA hand auger W washbore PT push tube * bit shown by suffix e.g. B blank bit T TC bit V V bit	support M mud C casing penetration  10-Oct-12 water level on date shown water inflow water outflow	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet Wp plastic limit WL liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

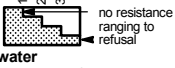
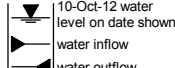
Engineering Log - Borehole

client: **St Hilliers**
principal:
project: **Geotechnical and Environmental Assessment**
location: **32 Mann Street, Gosford, NSW**

Borehole ID. **BH8**
sheet: 2 of 2
project no. **SYDGE214942**
date started: **06 Mar 2018**
date completed: **06 Mar 2018**
logged by: **LP**
checked by: **AM**

position: E: 345,745.57; N: 6,299,797.53 (MGA94) surface elevation: 2.50 m (AHD) angle from horizontal: 90°
drill model: Geoprobe 7822DT, Track mounted drilling fluid: Water hole diameter : 100 mm

drilling information						material substance								
method & support	penetration			water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
	1	2	3							SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components				
AD/T						-6			CL	Sandy CLAY: medium to high plasticity, grey.	M	H		RESIDUAL SOIL
										Borehole BH8 terminated at 8.57 m Refusal				
						9.0								
						-7								
						10.0								
						-8								
						11.0								
						-9								
						12.0								
						-10								
						13.0								
						-11								
						14.0								
						-12								
						15.0								
						-13								

method AD auger drilling* AS auger screwing* HA hand auger W washbore PT push tube * bit shown by suffix e.g. B blank bit T TC bit V V bit	support M mud N nil C casing penetration  water 	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet Wp plastic limit WI liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID. **BH9**

sheet: 1 of 2

project no. **SYDGE214942**

date started: **06 Mar 2018**

date completed: **06 Mar 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,723.00; N: 6,299,841.00 (MGA94)

surface elevation: 2.60 m (AHD)

angle from horizontal: 90°

drill model: Geoprobe 7822DT, Track mounted

drilling fluid: Water

hole diameter : 100 mm

drilling information						material substance						
method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
PT ADIT								FILL: Gravelly SAND: fine to coarse grained, dark grey-brown, with fine angular gravel, trace of ceramics and concrete.	M			FILL PID: 2.0ppm
					-2.0		SC	CLAYEY SAND: fine to coarse grained, pale brown-orange, with low to medium plasticity clay, trace of root fibres.	L - MD			ALLUVIUM
					-1.0		CL	Silty CLAY: medium plasticity, dark brown-black, high organic content (root fibres).	St			PID: 0.7ppm
					-2.0							PID: 0.7ppm
					-0.0		SC	CLAYEY SAND: fine to coarse grained, grey, pale grey, with medium to high plasticity clay.	W L - MD			PID: 0.1ppm
					-3.0		CL	Sandy CLAY: medium to high plasticity, grey mottled red-orange, with fine to coarse grained sand.	St - VSt			RESIDUAL SOIL
					-4.0		CL	Silty CLAY: medium to high plasticity, pale grey-white, trace of fine grained gravel.	M VSt - H			
					-5.0							
method AD auger drilling* AS auger screwing* HA hand auger WB washbore PT push tube * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit			support M mud N nil C casing penetration  no resistance ranging to refusal water  10-Oct-12 water level on date shown water inflow water outflow			samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing			classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet Wp plastic limit WI liquid limit		consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense	

Engineering Log - Borehole

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID. **BH9**

sheet: 2 of 2

project no. **SYDGE214942**

date started: **06 Mar 2018**

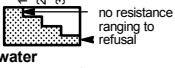
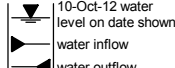
date completed: **06 Mar 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,723.00; N: 6,299,841.00 (MGA94) surface elevation: 2.60 m (AHD) angle from horizontal: 90°
drill model: Geoprobe 7822DT, Track mounted drilling fluid: Water hole diameter : 100 mm

drilling information					material substance									
method & support	penetration			water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
	1	2	3											
ADT ↓						-6 -9.0 -7 -10.0 -8 -11.0 -12.0 -10 -13.0 -11		CL	Silty CLAY: medium to high plasticity, pale grey-white, trace of fine grained gravel. (continued)	M	VSt - H		RESIDUAL SOIL	
						-12 -15.0 -13			Borehole BH9 terminated at 14.5 m Refusal					

method AD auger drilling* AS auger screwing* HA hand auger W washbore PT push tube * bit shown by suffix e.g. B blank bit T TC bit V V bit	support M mud N nil C casing penetration  water 	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet Wp plastic limit WI liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID. **P1**

sheet: 1 of 1

project no. **SYDGE214942**

date started: **28 Feb 2018**

date completed: **28 Feb 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,720.57; N: 6,299,886.73 (MGA94)

surface elevation: 2.90 m (AHD)

angle from horizontal: 90°

drill model: Geoprobe 7822DT, Track mounted

drilling fluid: Water

hole diameter : 100 mm

drilling information						material substance								
method & support	penetration		water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations	
PT									FILL: Gravelly CLAYEY SAND: fine to coarse grained, grey to dark grey, with low plasticity clay, and fine to medium angular gravel.	M			FILL 0.1-0.3m - ASS PID: 3.4ppm	
				E					FILL: CLAYEY SAND: fine to coarse grained, red-orange, with medium plasticity clay, trace of fine angular gravel.					
					-2	1.0		CH	CLAY: medium to high plasticity, dark brown-grey, spotted red.	W				ALLUVIUM PID: 3.4ppm 0.9-1.1m - ASS High organic content, smell of organics PID: 2.2ppm 1.7-2.0m - ASS
				E				CL	Silty CLAY: medium to high plasticity, dark brown-black, high organic content.					
				E	-1	2.0		CL	Sandy CLAY: medium to high plasticity, pale grey-grey, with fine grained sand.					
					-0	3.0				M				
						-1			Borehole P1 terminated at 3.0 m					
						-2								
						-3								
						-4								
						-5								

method

AD
AS
HA
WA
PT

support

M mud
C casing

samples & field tests

B bulk disturbed sample
D disturbed sample
E environmental sample
SS split spoon sample
U## undisturbed sample ##mm diameter
HP hand penetrometer (kPa)
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
VS vane shear; peak/remoulded (kPa)
R refusal
HB hammer bouncing

classification symbol & soil description

based on Unified Classification System

consistency / relative density

VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

bit shown by suffix

e.g. AD/T
B blank bit
T TC bit
V V hit

penetration

no resistance ranging to refusal

10-Oct-12 water level on date shown

water inflow

water outflow

moisture

D dry
M moist
W wet
Wp plastic limit
WI liquid limit

Engineering Log - Borehole

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID. **P2**

sheet: 1 of 1

project no. **SYDGE214942**

date started: **27 Feb 2018**

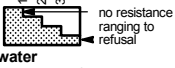
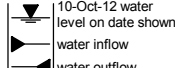
date completed: **27 Feb 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,726.57; N: 6,299,834.92 (MGA94) surface elevation: 2.60 m (AHD) angle from horizontal: 90°
drill model: Geoprobe 7822DT, Track mounted drilling fluid: Water hole diameter : 100 mm

drilling information						material substance								
method & support	penetration			water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetrometer (kPa) 100 200 300 400	structure and additional observations
	1	2	3											
PT										FILL: SAND: fine to coarse grained, dark grey-black, with fine to medium angular gravel.	M			FILL 0.1-0.3m - ASS PID: 2.6ppm
				E		-2			SC	CLAYEY SAND: fine to coarse grained, dark grey-brown, with medium to high plasticity clay.	W			ALLUVIUM
				E		-1	1.0		CH	Silty CLAY: medium to high plasticity, dark brown-black.				PID: 2.8ppm 1.1-1.2m - ASS
						-1								
						-2	2.0		SC	CLAYEY SAND: fine to coarse grained, medium to high plasticity, pale grey-grey, trace of fine gravel.				RESIDUAL SOIL PID: 2.8ppm 2.0-2.2m - ASS
				E		-3			CL	Sandy CLAY: medium to high plasticity, grey, with fine grained sand.				
						-4			CH	CLAY: medium to high plasticity, grey mottled brown-pale brown.	M			
						-5	3.0			Borehole P2 terminated at 3.0 m				
						-6	4.0							
						-7	5.0							
						-8	6.0							
						-9	7.0							
						-10								
						-11								
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						-95								
						-96								
						-97								
						-98								
						-99								
						-100								

method AD auger drilling* AS auger screwing* HA hand auger W washbore PT push tube * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	support M mud N nil C casing penetration  water 	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet Wp plastic limit Wl liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

Engineering Log - Borehole

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID. **P3**

sheet: 1 of 1

project no. **SYDGE214942**

date started: **27 Feb 2018**

date completed: **27 Feb 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,725.84; N: 6,299,792.39 (MGA94) surface elevation: 2.70 m (AHD) angle from horizontal: 90°
drill model: Geoprobe 7822DT, Track mounted drilling fluid: Water hole diameter : 100 mm

drilling information					material substance									
method & support	1 penetration	2 penetration	3 penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetrometer (kPa) 100 200 300 400	structure and additional observations
PT					E		0.1		SP	FILL: Gravelly CLAY: low to medium plasticity, grey, with fine to medium angular gravel.	M			FILL 0.1-0.2m - ASS ALLUVIUM PID: 2.9ppm RESIDUAL SOIL PID: 2.9ppm 1.1-1.3m - ASS PID: 2.4ppm 2.4-2.6m - ASS
						-2	1.0		SP	SAND: fine to coarse grained, grey, spotted red, with angular fine grained.				
									SP	SILTY SAND: fine to coarse grained, dark brown, highly organic.				
					E				CL	Sandy CLAY: medium to high plasticity, grey, brown, with fine grained sand.				
						-1			CH	Silty CLAY: medium to high plasticity, dark brown-grey.				
							2.0		CH	CLAY: medium to high plasticity, grey, trace sand.				
					E									
						-0								
							0							
						-3.0				Borehole P3 terminated at 3.0 m				
						-1	4.0							
						-2	5.0							
						-3	6.0							
						-4	7.0							
						-5								

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID. **P4**

sheet: 1 of 1

project no. **SYDGE214942**

date started: **27 Feb 2018**

date completed: **27 Feb 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,720.53; N: 6,299,761.38 (MGA94)

surface elevation: 2.70 m (AHD)

angle from horizontal: 90°

drill model: Geoprobe 7822DT, Track mounted

drilling fluid: Water

hole diameter : 100 mm

drilling information						material substance						
method & support	1 penetration	2 water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
PT			E					FILL: Gravelly CLAYEY SAND: fine to coarse grained, brown mottled orange-red, low plasticity clay, with fine angular gravel.	M		100 200 300 400	FILL
				-2		CH	Silty CLAY: medium to high plasticity, dark brown-black, with fine grained sand.	PID: 2.0ppm 0.2-0.5m - ASS				
			E	-1		SP	SAND: fine to medium grained, pale brown-grey, trace of silt.	ALLUVIUM PID: 3.0ppm 0.8-1.8m - ASS				
			E	-0		CH	CLAY: medium to high plasticity, brown, pale orange, with fine to medium sand.	PID: 2.4ppm 1.8-2.0m - ASS				
				-0				RESIDUAL SOIL 2.0-3.0m - ASS PID: 2.6ppm				
					-3.0			Borehole P4 terminated at 3.0 m				
					-1							
					-4.0							
					-2							
					-5.0							
					-3							
					-6.0							
					-4							
					-7.0							
					-5							

method

AD
AS
HA
WA
PT

support

M mud
C casing

penetration

no resistance ranging to refusal

samples & field tests

B bulk disturbed sample
D disturbed sample
E environmental sample
SS split spoon sample
U## undisturbed sample ##mm diameter
HP hand penetrometer (kPa)
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
VS vane shear; peak/remoulded (kPa)
R refusal
HB hammer bouncing

classification symbol & soil description

based on Unified Classification System

consistency / relative density

VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

moisture

D dry
M moist
W wet
Wp plastic limit
WI liquid limit

bit shown by suffix

e.g. AD/T

blank bit

B

TC bit

T

V hit

V

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID. **P5**

sheet: 1 of 1

project no. **SYDGE214942**

date started: **28 Feb 2018**

date completed: **28 Feb 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,701.52; N: 6,299,802.02 (MGA94)

surface elevation: 2.70 m (AHD)

angle from horizontal: 90°

drill model: Geoprobe 7822DT, Track mounted

drilling fluid: Water

hole diameter : 100 mm

drilling information					material substance							
method & support	1 penetration	2 water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
PT			E	2	1.0		SP	FILL: Gravelly CLAYEY SAND: dark grey, fine to coarse grained sand, low to medium plasticity clay, fine to coarse gravel.	M			FILL 0.2-0.3m - ASS PID: 2.2ppm
								SAND: fine to coarse grained, pale grey.				ALLUVIUM
								Sandy CLAY: medium to high plasticity, dark brown, with fine to medium plasticity sand.				PID: 1.5ppm 1.6-1.8m - ASS
								CLAYEY SAND: fine to medium grained, dark brown, with medium to high plasticity clay.				PID: 4.0ppm 2.0-2.2m - ASS
								CLAY: medium to high plasticity, grey mottled orange, trace of fine grained sand and silt.				RESIDUAL SOIL
				-0	2.0		CH	Borehole P5 terminated at 3.0 m				
				-1	4.0							
				-2	5.0							
				-3	6.0							
				-4	7.0							
				-5								

method

AD auger drilling*

AS auger screwing*

HA hand auger

W washbore

PT push tube

support

M mud

C casing

penetration

no resistance ranging to refusal

water

10-Oct-12 water level on date shown

water inflow

water outflow

samples & field tests

B bulk disturbed sample

D disturbed sample

E environmental sample

SS split spoon sample

U## undisturbed sample ##mm diameter

HP hand penetrometer (kPa)

N standard penetration test (SPT)

N* SPT - sample recovered

Nc SPT with solid cone

VS vane shear; peak/remoulded (kPa)

R refusal

HB hammer bouncing

classification symbol & soil description

based on Unified Classification System

moisture

D dry

M moist

W wet

Wp plastic limit

WI liquid limit

consistency / relative density

VS very soft

S soft

F firm

St stiff

VSt very stiff

H hard

Fb friable

VL very loose

L loose

MD medium dense

D dense

VD very dense

Engineering Log - Borehole

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID. **P6**

sheet: 1 of 1

project no. **SYDGE214942**

date started: **28 Feb 2018**

date completed: **28 Feb 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,696.69; N: 6,299,824.94 (MGA94)

surface elevation: 2.75 m (AHD)

angle from horizontal: 90°

drill model: Geoprobe 7822DT, Track mounted

drilling fluid: Water

hole diameter: 100 mm

drilling information					material substance										
method & support	penetration			water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)		structure and additional observations
	1	2	3										100	200	
PT					E				SP	FILL: Gravelly SAND: fine to coarse grained, red-brown, with fine angular gravel, trace ceramics, concrete, low to medium plasticity clay. SILTY SAND: fine to coarse grained, red, dark red, with silt and fine gravel. CLAYEY SAND: fine to medium grained, grey, with medium plasticity clay. Sandy Silty CLAY: medium to high plasticity, pale brown-orange-grey, with fine to coarse grained sand, trace of root fibres and organics.	M				FILL 0.1-0.2m - ASS ALLUVIUM PID: 2.2ppm PID: 2.6ppm 0.6-0.9m - ASS PID: 2.3ppm 1.0-1.3m - ASS
					E			SC							
					E			CH							
										Borehole P6 terminated at 3.0 m					
						</									

method AD auger drilling* AS auger screwing* HA hand auger W washbore PT push tube * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	support M mud C casing penetration water	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet Wp plastic limit WI liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

Engineering Log - Borehole

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID. **P7**

sheet: 1 of 1

project no. **SYDGE214942**

date started: **28 Feb 2018**

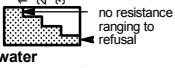
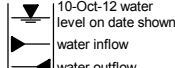
date completed: **28 Feb 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,700.01; N: 6,299,783.58 (MGA94) surface elevation: 2.50 m (AHD) angle from horizontal: 90°
drill model: Geoprobe 7822DT, Track mounted drilling fluid: Water hole diameter : 100 mm

drilling information						material substance								
method & support	penetration			water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
PT	1	2	3							FILL: Gravelly Sandy CLAY: low to medium plasticity, pale brown-brown, with fine to coarse grained sand, fine angular gravel.	M		100	FILL 0.1-0.3m - ASS PID: 3.2ppm
					-2			SC	CLAYEY SAND: fine to coarse grained, brown-dark brown, with medium plasticity clay.				ALLUVIUM	
				E	1.0		CH	Silty CLAY: medium to high plasticity, grey-dark grey-brown-black, highly organic with organics.						
				E	1									
				E	2.0		SP	SILTY SAND: fine to coarse grained, grey, with medium to high plasticity clay.		RESIDUAL SOIL				
				-0		CH	CLAY: medium to high plasticity, grey mottled dark grey, with fine to coarse grained sand.		PID: 1.9ppm 2.1-2.3m - ASS					
					3.0					Borehole P7 terminated at 3.0 m				
					-1									
					4.0									
					-2									
					5.0									
					-3									
					6.0									
					-4									
					7.0									
					-5									

method AD auger drilling* AS auger screwing* HA hand auger W washbore PT push tube * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	support M mud N nil C casing penetration  water 	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet Wp plastic limit WL liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

Engineering Log - Borehole

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Borehole ID. **P8**

sheet: 1 of 1

project no. **SYDGE214942**

date started: **28 Feb 2018**

date completed: **28 Feb 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,712.24; N: 6,299,840.53 (MGA94)

surface elevation: 2.60 m (AHD)

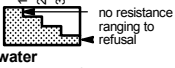
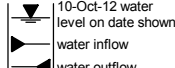
angle from horizontal: 90°

drill model: Geoprobe 7822DT, Track mounted

drilling fluid: Water

hole diameter : 100 mm

drilling information						material substance									
method & support	penetration			water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations	
PT	1	2	3							FILL: Gravelly SAND: fine to coarse grained, brown, with fine angular gravel, and low to medium plasticity clay.	M		100 200 300 400	FILL	
					E	2			CH	Silty CLAY: medium to high plasticity, dark brown-black, high organic matter, trace of brown sand.				PID: 2.0ppm 0.5-0.6m - ASS	
							1.0		SC	CLAYEY SAND: fine to coarse grained, pale grey-grey, with medium to high plasticity sand.				ALLUVIUM	
					E	1			SC	SAND: fine to coarse grained, pale grey-grey mottled brown, with medium to high plasticity clay.				PID: 2.5ppm 1.2-1.5m - ASS	
							2.0			2.0 m: colour changes to grey mottled red				PID: 2.0ppm 2.0-2.3m - ASS	
					E				CL	Sandy CLAY: medium to high plasticity, grey mottled red-orange, with fine grained sand.					
						0									
							3.0								
											Borehole P8 terminated at 3.0 m				
							-1								
							4.0								
						-2									
							5.0								
						-3									
							6.0								
						-4									
							7.0								
						-5									

method AD auger drilling* AS auger screwing* HA hand auger W washbore PT push tube * bit shown by suffix e.g. B blank bit T TC bit V V bit	support M mud N nil C casing penetration  water 	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet Wp plastic limit Wl liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

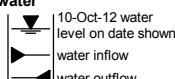
Engineering Log - Hand Auger

client: **St Hilliers**
 principal:
 project: **Geotechnical and Environmental Assessment**
 location: **32 Mann Street, Gosford, NSW**

Borehole ID. **HA1**
 sheet: 1 of 1
 project no. **SYDGE214942**
 date started: **19 Mar 2018**
 date completed: **19 Mar 2018**
 logged by: **LS**
 checked by:

position: Not Specified surface elevation: Not Specified angle from horizontal: 90°
 drill model: drilling fluid: hole diameter :

drilling information						material substance								
method & support	penetration			water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetrometer (kPa) 100 200 300 400	structure and additional observations
	1	2	3		E					FILL: Sandy CLAY : low plasticity, grey, fine to coarse grained sand, with some grout/cement/med over the surface.	D			DUP/Trip
														PID: 1.1ppm
										Hand Auger HA1 terminated at 0.2 m Refusal				No ACM staining/odour observed
							0.5							
							1.0							
							1.5							

method AD auger drilling* AS auger screwing* HA hand auger W washbore PT push tube * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	support M mud N nil C casing penetration  water 	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet Wp plastic limit WI liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

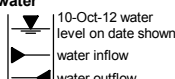
Engineering Log - Hand Auger

Borehole ID. **HA2**
 sheet: 1 of 1
 project no. **SYDGE214942**
 date started: **19 Mar 2018**
 date completed: **19 Mar 2018**
 logged by: **LS**
 checked by:

client: **St Hilliers**
 principal:
 project: **Geotechnical and Environmental Assessment**
 location: **32 Mann Street, Gosford, NSW**

position: Not Specified surface elevation: Not Specified angle from horizontal: 90°
 drill model: drilling fluid: hole diameter :

drilling information					material substance				
method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	structure and additional observations
	1 2 3							FILL: Sandy CLAY: low plasticity, brown, fine to coarse grained sand, with some gravels.	PID: 1.1ppm
			E		0.5				No ACM staining/odour observed
			E						PID: 2.6ppm
								0.8 m: boulder	
					1.0			Hand Auger HA2 terminated at 0.9 m Refusal	
					1.5				

method AD auger drilling* AS auger screwing* HA hand auger W washbore PT push tube * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	support M mud C casing penetration  water 	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet Wp plastic limit WI liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

Engineering Log - Excavation

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Excavation ID. **TP1**

sheet: 1 of 1

project no. **SYDGE214942**

date excavated: **22 Feb 2018**

date completed: **22 Feb 2018**

logged by: **LS**

checked by: **SH**

position: Not Specified surface elevation: Not Specified pit orientation:
equipment type: excavation method: excavation dimensions:

excavation information						material substance									
method	support	penetration			water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
		1	2	3							SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components			100 200 300 400	
											ASPHALT.				
					E						FILL: Sandy GRAVEL: grey, fine to medium grained gravel, fine to medium sand, minor presence of low plasticity clay.				PID: 4.2ppm
							0.5				FILL: Sandy CLAY: fine to medium grained, high plasticity, brown-red, with some wood (timber beams), metal (scrap) and sandstone (boulders).				Groundwater seepage at 0.3m (top of clay) Metal pipe noted PID: 6.8ppm
					E		1.0				CLAY: high plasticity, black, no shells observed.				
							1.5								PID: 5.1ppm No ACM observed
							2.0				Test pit TP1 terminated at 2.0 m				
							2.5								
							3.0								
							3.5								

method	penetration	samples & field tests	classification symbol & soil description based on Unified Classification System	consistency / relative density
N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator	no resistance ranging to refusal	U## undisturbed sample ##mm diameter D disturbed sample B bulk disturbed sample E environmental sample HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shearpeak/remoulded (uncorrected kPa) R refusal	moisture D dry M moist W wet W _p plastic limit W _L liquid limit	VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
support N none S shoring	10-Oct-12 water level on date shown water inflow water outflow			

Engineering Log - Excavation

client: St Hilliers	Excavation ID: TP2
principal:	sheet: 1 of 1
project: Geotechnical and Environmental Assessment	project no: SYDGE214942
location: 32 Mann Street, Gosford, NSW	date excavated: 22 Feb 2018
	date completed: 22 Feb 2018
	logged by: LS
	checked by: SH

position: Not Specified	surface elevation: Not Specified	pit orientation:
equipment type:	excavation method:	excavation dimensions:

excavation information						material substance					
method	support	1 penetration	2 water	3 field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density
									SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components		hand penetrometer (kPa)
											100 200 300 400
									ASPHALT.		
									FILL: Sandy GRAVEL: grey, fine to coarse grained gravel, fine to medium grained sands, with presence of terracotta pipes.		
						0.5			FILL: Sandy CLAY: low plasticity, yellow, fine to medium grained sands, with some timber beams.		
						1.0			CLAY: high plasticity, black.		
						1.5			0.8 m: black clay		
						2.0			1.2 m: grading to grey clay		
						2.5			Test pit TP2 terminated at 2.0 m		
						3.0					
						3.5					

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator support N none S shoring	penetration water 	samples & field tests U## undisturbed sample ##mm diameter D disturbed sample B bulk disturbed sample E environmental sample HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shearpeak/remoulded (uncorrected kPa) R refusal	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

Engineering Log - Excavation

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Excavation ID. **TP3**

sheet: 1 of 1

project no. **SYDGE214942**

date excavated: **22 Feb 2018**

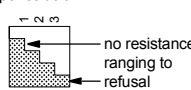
date completed: **22 Feb 2018**

logged by: **LS**

checked by: **SH**

position: Not Specified surface elevation: Not Specified pit orientation:
equipment type: excavation method: excavation dimensions:

excavation information						material substance					
method	support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density
		1 2 3							SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components		hand penetrometer (kPa) 100 200 300 400
				E		0.5			FILL: Gravelly SAND: yellow-brown, fine to medium grained sand, fine to coarse gravels, with some plastic, roots, bricks and terracotta.		
				E		1.0			FILL: Sandy CLAY: low plasticity, black, fine to medium grained sand, with some roots.		
				E		1.5			CLAY: high plasticity, grey.		
						2.0			Test pit TP3 terminated at 2.0 m		
						2.5					
						3.0					
						3.5					

method N natural exposure X existing excavation BH backhoe bucket B bulldozer blade R ripper E excavator support N none S shoring	penetration  no resistance ranging to refusal water 10-Oct-12 water level on date shown water inflow water outflow	samples & field tests U## undisturbed sample ##mm diameter D disturbed sample B bulk disturbed sample E environmental sample HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shearpeak/remoulded (uncorrected kPa) R refusal	classification symbol & soil description based on Unified Classification System moisture D dry M moist W wet W _p plastic limit W _L liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Hole ID. **BH4**

sheet: 1 of 1

project no. **SYDGE214942**

date started: **27 Feb 2018**

date completed: **27 Feb 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,707.00; N: 6,299,886.00 (MGA94)

surface elevation: 2.80 m (AHD)

angle from horizontal: 90°

equipment type: Geoprobe 7822DT, Track mounted

drilling fluid: Water

hole diameter : 100 mm

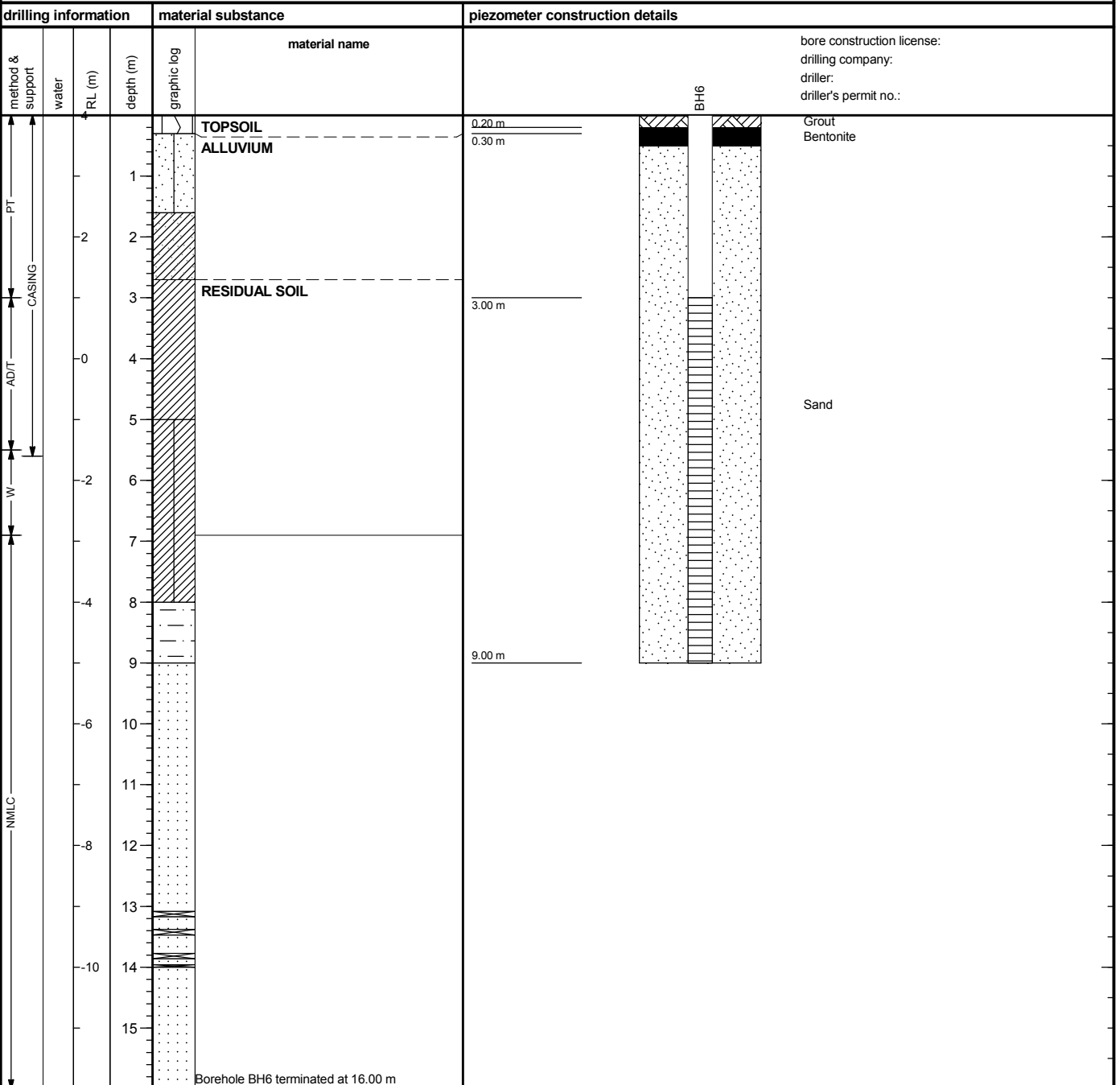
drilling information				material substance		piezometer construction details					
method & support	water	RL (m)	depth (m)	graphic log	material name	0.20 m 0.30 m 1.00 m BH4 Grout Bentonite Sand bore construction license: drilling company: driller: driller's permit no.:					
PT AD/T W NMLC			-2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	FILL ALLUVIUM RESIDUAL SOIL							
method & support see engineering log for details water 10-Oct-12, water level on date shown water inflow complete drilling fluid loss partial drilling fluid loss water pressure test result (Lugeons) for depth interval shown				graphic log / core recovery							

Piezometer Installation Log

client: **St Hilliers**
principal:
project: **Geotechnical and Environmental Assessment**
location: **32 Mann Street, Gosford, NSW**

Hole ID. **BH6**
sheet: 1 of 1
project no. **SYDGE214942**
date started: **01 Mar 2018**
date completed: **01 Mar 2018**
logged by: **LP**
checked by: **AM**

position: E: 345,761.69; N: 6,299,796.39 (MGA94) surface elevation: 4.00 m (AHD) angle from horizontal: 90°
equipment type: Geoprobe 7822DT, Track mounted drilling fluid: Water hole diameter: 100 mm



method & support	graphic log / core recovery	ID	type	installation date	stickup (m)	tip depth (m)	water level (m)	Relative Levels (AHD)
see engineering log for details water 10-Oct-12, water level on date shown water inflow complete drilling fluid loss partial drilling fluid loss water pressure test result (lugeons) for depth interval shown	core recovered (graphic symbols indicate material) no core recovered	BH6	standpipe piezo.			9.00 m		stickup tip water level -5.00

Piezometer Installation Log

client: **St Hilliers**

principal:

project: **Geotechnical and Environmental Assessment**

location: **32 Mann Street, Gosford, NSW**

Hole ID. **BH7**

sheet: 1 of 1

project no. **SYDGE214942**

date started: **02 Mar 2018**

date completed: **02 Mar 2018**

logged by: **LP**

checked by: **AM**

position: E: 345,710.50; N: 6,299,759.90 (MGA94)

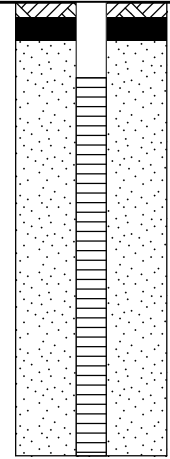
surface elevation: 2.50 m (AHD)

angle from horizontal: 90°

equipment type: Geoprobe 7822DT, Track mounted

drilling fluid: Water

hole diameter : 100 mm

drilling information				material substance		piezometer construction details							
method & support	water	RL (m)	depth (m)	graphic log	material name	bore construction license: drilling company: driller: driller's permit no.:							
PT ADT NMLC			-2		FILL	0.20 m							
			1		ALLUVIUM	0.30 m							
			2		RESIDUAL SOIL	1.00 m							
			3										
			4										
			5										
			6			6.00 m							
			7										
			8										
			9										
			10										
			11										
			12										
			13										
			14										
		15											
method & support see engineering log for details					graphic log / core recovery  core recovered (graphic symbols indicate material)  no core recovered	ID	type	installation date	stickup (m)	tip depth (m)	water level (m)	Relative Levels (AHD) stickup tip water level	
water  10-Oct-12, water level on date shown  water inflow  complete drilling fluid loss  partial drilling fluid loss  water pressure test result (lugeons) for depth interval shown						BH7	standpipe piezo.			6.00 m		-3.50	

Appendix D – Calibration Certificates

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RENTALS

Equipment Report – Solinst Model 122 Interface Meter

This Meter has been performance checked / calibrated* as follows:

Cleaned/Tested

Pass? ☒ Yes

☐ No

☒ Probe

☒ Tape/Reel

☒ Performance Test & Battery Voltage Check (8.5 v) 8.0v minimum

Date: 15/03/2018 Checked by: Jerry

Signed: [Signature]

Please check that the following items are received and that all items are cleaned and decontaminated before return. A minimum \$20 cleaning / service / repair charge may be applied to any unclean or damaged items. Items not returned will be billed for at the full replacement cost.

Sent	Received	Returned	Item
☒	☐	☐	Operations check OK
☒	☐	☐	Plastic Box / Bag
☒	☐	☐	Spare 9V Battery Qty 1
☒	☐	☐	Probe Cleaning Brush
☐	☐	☐	Decon
☒	☐	☐	Instruction leaflet
☒	☐	☐	Tape Guide
☐	☐	☐	
Processors Signature/ Initials			[Signature]

Quote Reference	CS008492	Condition on return
Customer Ref		
Equipment ID	SOL122-33	
Equipment serial no.	252093	
Return Date	/ /	
Return Time		

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Phone: (Free Call) 1300 735 295		Fax: (Free Call) 1800 675 123		Email: RentalsAU@Thermofisher.com	
Melbourne Branch 5 Caribbean Drive, Scoresby 3179	Sydney Branch Level 1, 4 Talavera Road, North Ryde 2113	Adelaide Branch 27 Beulah Road, Norwood, South Australia 5067	Brisbane Branch Unit 2/5 Ross St Newstead 4006	Perth Branch 121 Berlingara Ave Malaga WA 6090	

RENTALS

Equipment Report - MiniRAE 3000 PID

This Gas Meter has been performance checked and calibrated as follows:

Lamp	Compound	Concentration	Zero	Span	Traceability Lot #	Pass?
10.6 eV	Isobutylene	100 ppm	00 ppm	100.0 ppm	384261	☒

Alarm Limits

High	100 ppm
Low	50 ppm

Bump Test

Date	Target Gas	Reading	Pass?
21/02/2018	100 ppm	100.3 ppm	☒

- ☒ Battery Status
☒ 10 minutes test complete
☒ Spare battery status (Min 5.5 volts)
☒ Electrical Safety Tag attached (AS/NZS 3760)

- ☒ Performance check (pump, lamp, sensor)
☒ Data cleared
☒ Filters checked

Tag No: 000000

Valid to: 01/05/2018

Date: 21/02/2018

Signed: [Signature]

Please check that the following items are received and that all items are cleaned and decontaminated before return. A minimum \$30 cleaning / service / repair charge may be applied to any unclean or damaged items. Items not returned will be billed for at the full replacement cost.

Sent	Returned	Item
☒	☐	MiniRAE 2000 PID / Operational Check / Battery Status 100%
☒	☐	Lamp 10.6 eV, Compound Set to: isobutylene C/factor: 1
☒	☐	Protective yellow rubber boot
☒	☐	Inlet probe (attached to PID)
☒	☐	Spare water trap filter(s) Qty 2
☒	☐	Charger 240V to 12V1250mA
☒	☐	Cradle and Travel Charger
☒	☐	Instruction Manual behind foam on the lid of case "
☒	☐	Quick Guide Sheet behind foam on the lid of case "
☒	☐	Spare Alkaline Battery Compartment with batteries
☒	☐	Inline Moisture trap Filter Guide Laminated
☒	☐	Calibration regulator & tubing (optional)
☒	☐	Data cable and Software CD (optional)
☒	☐	Carry Case
☒	☐	Check to confirm electrical safety (tag must be valid)

Date: 21/02/2018

Signed: [Signature]

TFS Reference	CS008349	Return Date:	/ /
Customer Reference		Return Time:	
Equipment ID	PID2-176	Condition on return:	
Equipment Serial No.	592919100		

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	Brisbane Branch Unit 2/5 Ross St Newstead 4006	Perth Branch 121 Beringara Ave Malaga WA 6090

RENTALS

Equipment Report - MiniRAE 3000 PID

This Gas Meter has been performance checked and calibrated as follows:

Lamp	Compound	Concentration	Zero	Span	Traceability Lot #	Pass?
10.6 eV	Isobutylene	100 ppm	0.0 ppm	100.0 ppm	319201	☒

Alarm Limits

High	100 ppm
Low	50 ppm

Bump Test

Date	Target Gas	Reading	Pass?
16/03/2018	100 ppm	99.9 ppm	☒

- ☒ Battery Status 100%
☒ 10 minutes test complete
☒ Spare battery status (Min 5.5 volts)
☒ Electrical Safety Tag attached (AS/NZS 3760)

- ☐ Performance check (pump, lamp, sensor)
☐ Data cleared
☐ Filters checked

Tag No: 00 673

Valid to: 05/05/2018

Date: 16/03/2018

Signed: [Signature]

Please check that the following items are received and that all items are cleaned and decontaminated before return. A minimum \$30 cleaning / service / repair charge may be applied to any unclean or damaged items. Items not returned will be billed for at the full replacement cost.

Sent	Returned	Item
☒	☐	MiniRAE 2000 PID / Operational Check / Battery Status <u>100%</u>
☒	☐	Lamp 10.6 eV, Compound Set to: isobutylene C/factor: <u>1</u>
☒	☐	Protective yellow rubber boot
☒	☐	Inlet probe (attached to PID)
☒	☐	Spare water trap filter(s) Qty <u>2</u>
☒	☐	Charger 240V to 12V1250mA
☒	☐	Cradle and Travel Charger
☒	☐	Instruction Manual behind foam on the lid of case "
☒	☐	Quick Guide Sheet behind foam on the lid of case "
☒	☐	Spare Alkaline Battery Compartment with batteries
☒	☐	Inline Moisture trap Filter Guide Laminated
☒	☐	Calibration regulator & tubing (optional)
☒	☐	Data cable and Software CD (optional)
☒	☐	Carry Case
☒	☐	Check to confirm electrical safety (tag must be valid)

Date: 16/03/2018

Signed: [Signature]

TFS Reference	<u>C5008492</u>	Return Date:	<u>1 / 1</u>
Customer Reference		Return Time:	
Equipment ID	<u>PID3000-14</u>	Condition on return:	
Equipment Serial No.	<u>592 913297</u>		

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	Brisbane Branch Unit 2/5 Ross St Newstead 4006	Perth Branch 121 Beringarra Ave Malga WA 6090

RENTALS

Equipment Certification Report – TPS 90FLMV Water Quality Meter

This Water Quality Meter has been performance checked and calibrated as follows:

Sensor	Concentration	Span 1	Span 2	Traceability Lot #	Pass?
pH	pH 7.00 / pH 4.00	7.00 pH	4.00 pH	300765/310916	☒
Conductivity	1288mS/cm	0.0 mS/cm	12.88 mS/cm	312392	☒
TDS	36 ppk	0.0 ppk	36.0 ppk	313394	☒
Dissolved Oxygen	Sodium Sulphite / Air	0.0 ppm In Sodium Sulphite	8.0 ppm Saturation in Air	5656(ss) 306207(DI)	☒

Check only

Redox (ORP) *	Electrode operability test	240mV +/- 10%	223 mV	311901(A) 311902(B)	☒

* This meter uses an Ag/AgCl ORP electrode. To convert readings to SHE (Standard Hydrogen Electrode), add 199mV to the mV reading.

- ☒ Battery Status 8.3V (min 7.2V)
☒ Electrical Safety Tag attached (AS/NZS 3760)

- ☒ Temperature 22.4 °C
☐ Electrodes Cleaned and checked

Tag No: 000041

Valid to: 01/04/2018

Date: 10/03/2018

Signed: [Signature]

Please check that the following items are received and that all items are cleaned and decontaminated before return. A minimum \$30 cleaning / service / repair charge may be applied to any unclean or damaged items. Items not returned will be billed for at the full replacement cost.

Sent	Returned	Item
☒	☐	90FLMV Unit. Ops check/Battery status: <u>8.3V</u>
☒	☐	pH sensor with wetting cap, 5m
☒	☐	Conductivity/TDS/Temperature K=10 sensor, 5m
☒	☐	Dissolved oxygen YSI5739 sensor with wetting cap, 5m
☒	☐	Redox (ORP) sensor with wetting cap, 5m
☒	☐	Power supply 240V to 12V DC 200mA
☒	☐	Instruction Manual
☒	☐	Quick Guide
☒	☐	Syringe with storage solution for pH and ORP sensors
☒	☐	Carry Case
☒	☐	Check to confirm electrical safety (tag must be valid)

Date: 16/03/2018

Signed: [Signature]

TFS Reference	<u>CS008492</u>	Return Date:	<u>1 / 1</u>
Customer Reference		Return Time:	
Equipment ID	<u>90FLMV SN</u>	Condition on return:	
Equipment Serial No.	<u>U3539</u>		

"We do more than give you great equipment... We give you great solutions!"

Phone: (Free Call) 1300 735 295		Fax: (Free Call) 1800 675 123		Email: RentalsAU@Thermofisher.com	
Melbourne Branch 5 Caribbean Drive, Scoresby 3179	Sydney Branch Level 1, 4 Talavera Road, North Ryde 2113	Adelaide Branch 27 Beulah Road, Norwood, South Australia 5067	Brisbane Branch Unit 2/5 Ross St Newstead 4006	Perth Branch 121 Beringarra Ave Malaga WA 6090	

RENTALS

Equipment Report - GEOTECHNICAL INSTRUMENTS GA5000

This Gas Meter has been performance checked and calibrated as follows:

Sensor	Concentration	Zero	Span	Traceability Lot #	Pass?
CH ₄	60 %	0.0 %	60.0 %	501 3 C18	☒
CO ₂	40 %	-----	40.0 %	5 3 8 C18	☒
O ₂	20.9 %	0.0 %	20.9 %	A2R	☒
CO	100 ppm	0 ppm	100 ppm	47 C3	☒
H ₂ S	25 ppm	0 ppm	25 ppm	1 C44	☐
H ₂ CO/H2 compensated only	1000 ppm	0 ppm	1000 ppm	867138 C31	☒

- ☒ Battery Status 100%
☒ 10 minutes test complete
☒ Electrical Safety Tag attached (AS/NZS 3760)

- ☒ In-Line filters checked
☒ Data cleared

Tag No: 000047

Valid to: 05/04/2018

Date: 10/03/2018

Signed: [Signature]

Please check that the following items are received and that all items are cleaned and decontaminated before return. A minimum \$30 cleaning / service / repair charge may be applied to any unclean or damaged items. Items not returned will be billed for at the full replacement cost.

Sent	Returned	Item
☒	☐	Performance check / Battery <u>100%</u>
☒	☐	Sampling tubing with In-Line filter
☒	☐	Out let tubing (internal flow pod only)
☒	☐	Well cap Quick connect fitting with tubing and In-Line filter
☒	☐	Power Supply
☒	☐	Operating Quick Guide <u>behind foam on lid of case</u>
☒	☐	Manual <u>behind foam on lid of case</u>
☒	☐	Spare Inline Filters Qty <u>2</u>
☒	☐	H ₂ S filter
☒	☐	Data Cable and Software CD
☒	☐	Soft case with carry strap
☒	☐	Carry case
☒	☐	Check to confirm electrical safety (tag must be valid)

Date: 01/02/2018

Signed: [Signature]

TFS Reference	<u>CS008519</u>	Return Date:	<u>1 / 1</u>
Customer Reference		Return Time:	
Equipment ID	<u>GA50 XB</u>	Condition on return:	
Equipment Serial No.	<u>GA500716</u>		

"We do more than give you great equipment... We give you great solutions!"

Phone: (Free Call) 1300 735 295		Fax: (Free Call) 1800 675 123		Email: RentalsAU@Thermofisher.com	
Melbourne Branch 5 Camber Drive, Scoresby 3179	Sydney Branch Level 1, 4 Televera Road, North Ryde 2113	Adelaide Branch 27 Beulah Road, Norwood, South Australia 5067	Brisbane Branch Unit 2/5 Ross St Newstead 4006	Perth Branch 121 Bellingara Ave Malaga WA 6060	

Appendix E – Laboratory Analytical Certificates

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Enviro Sample NSW

From: Hay, Simon <Simon.Hay@coffey.com>
Sent: Tuesday, 27 February 2018 8:19 AM
To: Enviro Sample NSW; Nibha Vaidya
Subject: SPOCAS testing
Attachments: 586427-S_report.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Hi there,

Can I schedule in sample BH2_1.9-2.0 for SPOCAS testing on a standard turnaround please?

Kind Regards,

Simon Hay
Environmental Scientist

Level 20, Tower B - Citadel Tower
799 Pacific Highway Chatswood NSW 2067

t: +61 2 9406 1060
f: +61 2 9406 1002
m: 0424 703 009
w: coffey.com



>>> Ingenuity@coffey – it's the ideas that count



Please consider the environment before printing this email

Click [here](#) to report this email as spam.

ScannedByWebsenseForEurofins

Sample Receipt Advice

Company name: **Coffey Geotechnics Pty Ltd Chatswood**
Contact name: **SIMON HAY**
Project name: **ADDITIONAL - SOIL ANALYSIS**
Project ID: **SYDGE241942**
COC number: **Not provided**
Turn around time: **5 Day**
Date/Time received: **Feb 27, 2018 8:19 PM**
Eurofins | mgt reference: **586842**

Sample information

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

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to SIMON HAY - simon.hay@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Geotechnics Pty Ltd Chatswood email address.

Certificate of Analysis

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Simon Hay

Report 586842-S
Project name ADDITIONAL - SOIL ANALYSIS
Project ID SYDGE241942
Received Date Feb 27, 2018

Client Sample ID			BH2_1.9-2.0
Sample Matrix			Soil
Eurofins mgt Sample No.			S18-Fe31876
Date Sampled			Feb 22, 2018
Test/Reference	LOR	Unit	
SPOCAS Suite			
pH-KCL	0.1	pH Units	5.0
pH-OX	0.1	pH Units	4.6
Acid trail - Titratable Actual Acidity	2	mol H+/t	4.0
Acid trail - Titratable Peroxide Acidity	2	mol H+/t	< 2
Acid trail - Titratable Sulfidic Acidity	2	mol H+/t	< 2
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	< 0.02
sulfidic - TPA equiv. S% pyrite	0.02	% pyrite S	< 0.02
sulfidic - TSA equiv. S% pyrite	0.02	% pyrite S	< 0.02
Sulfur - KCl Extractable	0.02	% S	< 0.02
Sulfur - Peroxide	0.02	% S	< 0.02
Sulfur - Peroxide Oxidisable Sulfur	0.02	% S	< 0.02
acidity - Peroxide Oxidisable Sulfur	10	mol H+/t	< 10
HCl Extractable Sulfur	0.02	% S	n/a
Net Acid soluble sulfur	0.02	% S	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a
Calcium - KCl Extractable	0.02	% Ca	0.03
Calcium - Peroxide	0.02	% Ca	0.03
Acid Reacted Calcium	0.02	% Ca	< 0.02
acidity - Acid Reacted Calcium	10	mol H+/t	< 10
sulfidic - Acid Reacted Ca equiv. S% pyrite	0.02	% S	< 0.02
Magnesium - KCl Extractable	0.02	% Mg	0.02
Magnesium - Peroxide	0.02	% Mg	0.02
Acid Reacted Magnesium	0.02	% Mg	< 0.02
acidity - Acid Reacted Magnesium	10	mol H+/t	< 10
sulfidic - Acid Reacted Mg equiv. S% pyrite	0.02	% S	< 0.02
Acid Neutralising Capacity (ANCE)	0.02	%CaCO3	n/a
Acid Neutralising Capacity - Acidity units (a-ANCE)	10	mol H+/t	n/a
Acid Neutralising Capacity - equivalent S% pyrite(s-ANCE)	0.02	% S	n/a
ANC Fineness Factor		factor	1.5
SPOCAS - Net Acidity (Sulfur Units)	0.02	% S	< 0.02
SPOCAS - Net Acidity (Acidity Units)	10	mol H+/t	< 10
SPOCAS - Liming rate	1	kg CaCO3/t	< 1

Client Sample ID			BH2_1.9-2.0
Sample Matrix			Soil
Eurofins mgt Sample No.			S18-Fe31876
Date Sampled			Feb 22, 2018
Test/Reference	LOR	Unit	
Extraneous Material			
<2mm Fraction	0.005	g	170
>2mm Fraction	0.005	g	1.4
Analysed Material	0.1	%	99
Extraneous Material	0.1	%	0.8
% Moisture	1	%	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 (regarding both quality and NATA accreditation).

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			
SPOCAS Suite	Brisbane	Mar 02, 2018	6 Week
- Method: LTM-GEN-7050			
Extraneous Material	Brisbane	Mar 02, 2018	6 Week
- Method: LTM-GEN-7050/7070			
% Moisture	Brisbane	Feb 27, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name: Coffey Geotechnics Pty Ltd Chatswood
Address: Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: ADDITIONAL - SOIL ANALYSIS
Project ID: SYDGE241942

Order No.:
Report #: 586842
Phone: +61 2 9406 1000
Fax: +61 2 9406 1002

Received: Feb 27, 2018 8:19 PM
Due: Mar 7, 2018
Priority: 5 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						SPOCAS Suite	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794						X	X
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	BH2_1.9-2.0	Feb 22, 2018		Soil	S18-Fe31876	X	X
Test Counts						1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota 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. 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	Quality Systems Manual ver 5.1 US Department of Defense
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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

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

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
SPOCAS Suite				Result 1	Result 2	RPD			
pH-KCL	B18-Ma01750	NCP	pH Units	9.1	9.1	<1	30%	Pass	
pH-OX	B18-Ma01750	NCP	pH Units	6.4	6.4	<1	30%	Pass	
Acid trail - Titratable Actual Acidity	B18-Ma01750	NCP	mol H+/t	< 2	< 2	<1	30%	Pass	
Acid trail - Titratable Peroxide Acidity	B18-Ma01750	NCP	mol H+/t	< 2	< 2	<1	30%	Pass	
Acid trail - Titratable Sulfidic Acidity	B18-Ma01750	NCP	mol H+/t	< 2	< 2	<1	30%	Pass	
sulfidic - TAA equiv. S% pyrite	B18-Ma01750	NCP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
sulfidic - TPA equiv. S% pyrite	B18-Ma01750	NCP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
sulfidic - TSA equiv. S% pyrite	B18-Ma01750	NCP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - KCl Extractable	B18-Ma01750	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - Peroxide	B18-Ma01750	NCP	% S	0.02	0.02	18	30%	Pass	
Sulfur - Peroxide Oxidisable Sulfur	B18-Ma01750	NCP	% S	0.02	0.02	18	30%	Pass	
acidity - Peroxide Oxidisable Sulfur	B18-Ma01750	NCP	mol H+/t	15	13	18	30%	Pass	
HCl Extractable Sulfur	B18-Ma01750	NCP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur	B18-Ma01750	NCP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - acidity units	B18-Ma01750	NCP	mol H+/t	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	B18-Ma01750	NCP	% S	n/a	n/a	n/a	30%	Pass	
Calcium - KCl Extractable	B18-Ma01750	NCP	% Ca	0.06	0.06	<1	30%	Pass	
Calcium - Peroxide	B18-Ma01750	NCP	% Ca	0.06	0.06	8.0	30%	Pass	
Acid Reacted Calcium	B18-Ma01750	NCP	% Ca	< 0.02	< 0.02	<1	30%	Pass	
acidity - Acid Reacted Calcium	B18-Ma01750	NCP	mol H+/t	< 10	< 10	<1	30%	Pass	
sulfidic - Acid Reacted Ca equiv. S% pyrite	B18-Ma01750	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Magnesium - KCl Extractable	B18-Ma01750	NCP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
Magnesium - Peroxide	B18-Ma01750	NCP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
Acid Reacted Magnesium	B18-Ma01750	NCP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
acidity - Acid Reacted Magnesium	B18-Ma01750	NCP	mol H+/t	< 10	< 10	<1	30%	Pass	
sulfidic - Acid Reacted Mg equiv. S% pyrite	B18-Ma01750	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Acid Neutralising Capacity (ANCE)	B18-Ma01750	NCP	%CaCO3	n/a	n/a	n/a	30%	Pass	
Acid Neutralising Capacity - Acidity units (a-ANCE)	B18-Ma01750	NCP	mol H+/t	n/a	n/a	n/a	30%	Pass	
ANC Fineness Factor	B18-Ma01750	NCP	factor	1.5	1.5	<1	30%	Pass	
SPOCAS - Liming rate	B18-Ma01750	NCP	kg CaCO3/t	< 1	< 1	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	P18-Fe33276	NCP	%	7.3	7.7	5.0	30%	Pass	

Comments

Sample Integrity

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

Comments

Qualifier Codes/Comments

Code	Description
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5

Authorised By

Nibha Vaidya	Analytical Services Manager
Myles Clark	Senior Analyst-Metal (QLD)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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Certificate of Analysis

Coffey Geotechnics Pty Ltd Chatswood
 Level 18, Tower B, Citadel Tower 799 Pacific Highway
 Chatswood
 NSW 2067



NATA Accredited
 Accreditation Number 1261
 Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: Edward Wu

Report 586427-S
 Project name SOIL ANALYSIS
 Project ID SYDGE241942
 Received Date Feb 23, 2018

Client Sample ID			BH2_0.9-1.0	BH2_1.9-2.0	BH2_2.9-3.0
Sample Matrix			Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Fe29451	S18-Fe29452	S18-Fe29453
Date Sampled			Feb 22, 2018	Feb 22, 2018	Feb 22, 2018
Test/Reference	LOR	Unit			
Acid Sulfate Soils Field pH Test					
pH-F (Field pH test)*	0.1	pH Units	7.4	7.1	8.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.1	3.1	6.0
Reaction Ratings* ^{S05}		comment	2.0	2.0	2.0

Sample History

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

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

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

Acid Sulfate Soils Field pH Test

Testing Site

Sydney

Extracted

Feb 26, 2018

Holding Time

7 Days

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

Company Name: Coffey Geotechnics Pty Ltd Chatswood
Address: Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: SOIL ANALYSIS
Project ID: SYDGE241942

Order No.:
Report #: 586427
Phone: +61 2 9406 1000
Fax: +61 2 9406 1002

Received: Feb 23, 2018 12:00 AM
Due: Feb 26, 2018
Priority: 1 Day
Contact Name: Edward Wu

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	BH2_0.9-1.0	Feb 22, 2018		Soil	S18-Fe29451		X
2	BH2_1.9-2.0	Feb 22, 2018		Soil	S18-Fe29452		X
3	BH2_2.9-3.0	Feb 22, 2018		Soil	S18-Fe29453		X
4	TP1_0.1-0.2	Feb 22, 2018		Soil	S18-Fe29454	X	
5	TP1_0.5-0.6	Feb 22, 2018		Soil	S18-Fe29455	X	
6	TP1_1.5-1.6	Feb 22, 2018		Soil	S18-Fe29456	X	
7	TP2_0.1-0.2	Feb 22, 2018		Soil	S18-Fe29457	X	
8	TP2_0.5-0.6	Feb 22, 2018		Soil	S18-Fe29458	X	
9	TP2_1.5-1.6	Feb 22, 2018		Soil	S18-Fe29459	X	

Company Name: Coffey Geotechnics Pty Ltd Chatswood
Address: Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: SOIL ANALYSIS
Project ID: SYDGE241942

Order No.:
Report #: 586427
Phone: +61 2 9406 1000
Fax: +61 2 9406 1002

Received: Feb 23, 2018 12:00 AM
Due: Feb 26, 2018
Priority: 1 Day
Contact Name: Edward Wu

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
10	DUP1	Feb 22, 2018		Soil	S18-Fe29460	X	
11	TRIP1	Feb 22, 2018		Soil	S18-Fe29461	X	
12	TP3 0.1-0.2	Feb 22, 2018		Soil	S18-Fe29462	X	
13	TP3 0.5-0.6	Feb 22, 2018		Soil	S18-Fe29463	X	
14	TP3 1.5-1.6	Feb 22, 2018		Soil	S18-Fe29464	X	
15	BH1 0.3-0.5	Feb 22, 2018		Soil	S18-Fe29465	X	
16	BH1 1-1.3	Feb 22, 2018		Soil	S18-Fe29466	X	
17	BH1 2.5-2.9	Feb 22, 2018		Soil	S18-Fe29467	X	
18	BH2 0.1-0.2	Feb 22, 2018		Soil	S18-Fe29468	X	
19	BH2 0.4-0.5	Feb 22, 2018		Soil	S18-Fe29469	X	
Test Counts						16	3

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota 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. 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 Sample Receipt Advice.

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.

****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	Quality Systems Manual ver 5.1 US Department of Defense
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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. 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.

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

Comments

Qualifier Codes/Comments

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

Authorised By

Nibha Vaidya Analytical Services Manager



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 1 of 2 8353Consigning Office: ChatswoodReport Results to: simon.hay@coffey.comInvoices to: "Mobile: 0424 703 009

Phone:

Email: simon.hay@coffey.com @coffey.comEmail: edward.wu @coffey.comProject No: 586249 Task No: 002Project Name: Laboratory: EurofinsSampler's Name: Luke Stiller Project Manager: Edward Wu

Special Instructions:

Relevant agreements: Eurofins COF_ENAUABTF00952AA_MSA1 ALS COF_ENAUABTF00952AA_MSA2 and SGS COF_ENAUABTF00952AA_MSA3

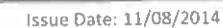
Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	Analysis Request Section										NOTES
							Suite 84-TM, DEX, PAN	Suite 118-Mchls	Suite 817-PCR, DEX	2H Full Screen (HLS, PHB)	SPOCs	TM (Co-Co) & DEX	Phosph	Hold			
	TP1-0.1-0.2 4	22/2	AM	Soil	13, 2Z		x	x	x								
	TP1-0.5-0.6						x	x	x								
	TP1-1.5-1.6																
	TP2-0.1-0.2 4						x	x	x								
	TP2-0.5-0.6						x	x	x								
	TP2-1.5-1.6						x	x	x								
	DUP1						x	x	x								
	TRIP1						x	x	x								
	Ri						x	x	x								
	TP3-0.1-0.2 4			water	1A, 2U, 1M		x	x	x								
	TP3-0.5-0.6			Soil	13, 2Z		x	x	x								
	TP3-1.5-1.6						x	x	x								
	BH1-0.3-0.5																
	BH1 1-1.5																
	BH1 2.5-2.9																
	BT12-0.1-0.2																
	BH2-0.4-0.8																
	BH2 0.9-1.0																

RELINQUISHED BY		RECEIVED BY		Sample Receipt Advice: (Lab Use Only)	
Name: <u>Simon Hay</u>	Date: <u>23/02/17</u>	Name: <u>Simon Hay</u>	Date: <u>23/02/17 4:41pm</u>	All Samples Received in Good Condition	☐
Coffey Environments	Time:	Company: <u>Eurofins</u>	Time: <u>4:41pm</u>	All Documentation is in Proper Order	☐
Name:	Date:	Name:	Date:	Samples Received Properly Chilled	☐
Company:	Time:	Company:	Time:	Lab. Ref/Batch No.	

*Container Type & Preservation Codes: P - Plastic, G - Glass Bottle, J - Glass Jar, V - Vial, Z - Ziplock Bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative, OP - Other Preservative

586249

Page 42 of 72 8354



Sample Receipt Advice

Company name: **Coffey Environments Pty Ltd NSW**

Contact name: Simon Hay

Project name: SOIL ANALYSIS

Project ID: SYDGE241942

COC number: Not provided

Turn around time: 5 Day

Date/Time received: Feb 23, 2018 4:41 PM

Eurofins | mgt reference: **586434**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 2.6 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Sample containers for volatile analysis received with zero headspace.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Simon Hay - simon.hay@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Environments Pty Ltd NSW email address.

Certificate of Analysis



Accredited for compliance with ISO/IEC 17025-Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Coffey Environments Pty Ltd NSW
Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Attention: Simon Hay
Report 586434-AID
Project Name SOIL ANALYSIS
Project ID SYDGE241942
Received Date Feb 23, 2018
Date Reported Mar 05, 2018

Methodology:

Asbestos Fibre
 Identification

Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques.

NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.

Unknown Mineral
 Fibres

Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity.

NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.

Subsampling Soil
 Samples

The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed.

NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.

Bonded asbestos-
 containing material
 (ACM)

The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination. The resultant material is then further examined in accordance with AS 4964 - 2004.

NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.

Limit of Reporting

The performance limitation of the AS4964 method for inhomogeneous samples is around 0.1 g/kg (0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis where required, this is considered to be at the nominal reporting limit of 0.01 % (w / w). The examination of large sample sizes (500 mL is recommended) may improve the likelihood of identifying ACM in the > 2mm fraction. The NEPM screening level of 0.001 % (w / w) asbestos in soil for FA (friable asbestos) and AF (asbestos fines) then applies where they are able to be quantified by gravimetric procedures. This quantitative screening is not generally applicable to FF (free fibres) and results of Trace Analysis are referred.

NOTE: NATA News March 2014, p.7, states in relation to AS4964: "This is a qualitative method with a nominal reporting limit of 0.01%" and that currently in Australia "there is no validated method available for the quantification of asbestos". Accordingly, NATA Accreditation does not cover the performance of this service (indicated with an asterisk). This report is consistent with the analytical procedures and reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended) and the Western Australia Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia, 2009, including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil, June 2011.

Project Name SOIL ANALYSIS
Project ID SYDGE241942
Date Sampled Feb 22, 2018
Report 586434-AID

Client Sample ID	Eurofins mgt Sample No.	Date Sampled	Sample Description	Result
TP1_0.1-0.2	18-Fe29545	Feb 22, 2018	Approximate Sample 807g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
TP2_0.1-0.2	18-Fe29547	Feb 22, 2018	Approximate Sample 742g Sample consisted of: Brown coarse grain soil, rocks and debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
TP3_0.1-0.2	18-Fe29552	Feb 22, 2018	Approximate Sample 582g Sample consisted of: Brown coarse grain soil, rocks and debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.

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 (regarding both quality and NATA accreditation).

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
Asbestos - LTM-ASB-8020	Sydney	Feb 26, 2018	Indefinite

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: SOIL ANALYSIS
Project ID: SYDGE241942

Order No.:
Report #: 586434
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Feb 23, 2018 4:41 PM
Due: Mar 2, 2018
Priority: 5 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	HOLD	Metals M8	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X					X	X
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID							
1	TP1_0.1-0.2	Feb 22, 2018		Soil	S18-Fe29545	X		X	X	X	X	
2	TP1_0.5-0.6	Feb 22, 2018		Soil	S18-Fe29546			X		X	X	
3	TP2_0.1-0.2	Feb 22, 2018		Soil	S18-Fe29547	X		X		X	X	
4	TP2_0.5-0.6	Feb 22, 2018		Soil	S18-Fe29548			X	X	X	X	
5	DUP1	Feb 22, 2018		Soil	S18-Fe29549			X	X	X	X	
6	TRIP1	Feb 22, 2018		Soil	S18-Fe29550			X	X	X	X	
7	R1	Feb 22, 2018		Water	S18-Fe29551			X	X		X	
8	TP3_0.1-0.2	Feb 22, 2018		Soil	S18-Fe29552	X		X		X	X	
9	TP3_1.5-1.6	Feb 22, 2018		Soil	S18-Fe29553			X		X	X	

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: SOIL ANALYSIS
Project ID: SYDGE241942

Order No.:
Report #: 586434
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Feb 23, 2018 4:41 PM
Due: Mar 2, 2018
Priority: 5 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	HOLD	Metals M8	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X					X	X
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
10	TS1	Feb 22, 2018		Soil	S18-Fe29554							X
11	TB1	Feb 22, 2018		Soil	S18-Fe29555							X
12	TP1 1.5-1.6	Feb 22, 2018		Soil	S18-Fe29557		X					
13	TP2 1.5-1.6	Feb 22, 2018		Soil	S18-Fe29558		X					
14	TP3 0.5-0.6	Feb 22, 2018		Soil	S18-Fe29559		X					
15	BH1 0.3-0.5	Feb 22, 2018		Soil	S18-Fe29560		X					
16	BH1 1-1.3	Feb 22, 2018		Soil	S18-Fe29561		X					
17	BH1 2.5-2.9	Feb 22, 2018		Soil	S18-Fe29562		X					
18	BH2 0.1-0.2	Feb 22, 2018		Soil	S18-Fe29563		X					
19	BH2 0.4-0.5	Feb 22, 2018		Soil	S18-Fe29564		X					
20	BH2 0.9-1.0	Feb 22, 2018		Soil	S18-Fe29606		X					
21	BH2 1.9-2.0	Feb 22, 2018		Soil	S18-Fe29607		X					

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: SOIL ANALYSIS
Project ID: SYDGE241942

Order No.:
Report #: 586434
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Feb 23, 2018 4:41 PM
Due: Mar 2, 2018
Priority: 5 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	HOLD	Metals M8	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X					X	X
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
22	BH2 2.9-3.0	Feb 22, 2018		Soil	S18-Fe29608		X					
Test Counts						3	11	9	5	8	9	2

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. 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 Sample Receipt Advice.

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.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Western Australia Department of Health
NOHSC	National Occupational Health and Safety Commission
ACM	Bonded asbestos-containing material means any material containing more than 1% asbestos and comprises asbestos-containing-material which is in sound condition, although possibly broken or fragmented, and where the asbestos is bound in a matrix such as cement or resin. Common examples of ACM include but are not limited to: pipe and boiler insulation, sprayed-on fireproofing, troweled-on acoustical plaster, floor tile and mastic, floor linoleum, transite shingles, roofing materials, wall and ceiling plaster, ceiling tiles, and gasket materials. This term is restricted to material that cannot pass a 7 mm x 7 mm sieve. This sieve size is selected because it approximates the thickness of common asbestos cement sheeting and for fragments to be smaller than this would imply a high degree of damage and hence potential for fibre release.
FA	FA comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. This material is typically unbonded or was previously bonded and is now significantly degraded (crumbling).
PACM	Presumed Asbestos-Containing Material means thermal system insulation and surfacing material found in buildings, vessels, and vessel sections constructed no later than 1980 that are assumed to contain greater than one percent asbestos but have not been sampled or analyzed to verify or negate the presence of asbestos.
AF	Asbestos fines (AF) are defined as free fibres, or fibre bundles, smaller than 7mm. It is the free fibres which present the greatest risk to human health, although very small fibres (< 5 microns in length) are not considered to be such a risk. AF also includes small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve. (Note that for bonded ACM fragments to pass through a 7 mm x 7 mm sieve implies a substantial degree of damage which increases the potential for fibre release.)
AC	Asbestos cement means a mixture of cement and asbestos fibres (typically 90:10 ratios).

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

Comments

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Sayeed Abu Senior Analyst-Asbestos (NSW)

Authorised by:

Matthew Quigley Senior Analyst-Asbestos (NSW)



Glenn Jackson
National Operations Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

Uncertainty data is available on request

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Certificate of Analysis

Coffey Environments Pty Ltd NSW
Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Simon Hay

Report 586434-S
Project name SOIL ANALYSIS
Project ID SYDGE241942
Received Date Feb 23, 2018

Client Sample ID			TP1_0.1-0.2	TP1_0.5-0.6	TP2_0.1-0.2	TP2_0.5-0.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Fe29545	S18-Fe29546	S18-Fe29547	S18-Fe29548
Date Sampled			Feb 22, 2018	Feb 22, 2018	Feb 22, 2018	Feb 22, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	74	71	70	70
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	1.3	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	1.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.8	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	1.2	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	1.3	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	1.0	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	< 0.5	0.7	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	0.6	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	0.6	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	1.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			TP1_0.1-0.2	TP1_0.5-0.6	TP2_0.1-0.2	TP2_0.5-0.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Fe29545	S18-Fe29546	S18-Fe29547	S18-Fe29548
Date Sampled			Feb 22, 2018	Feb 22, 2018	Feb 22, 2018	Feb 22, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	3.6	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	0.7	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	1.0	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	4.2	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	3.6	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	20	< 0.5
2-Fluorobiphenyl (surr.)	1	%	81	91	101	104
p-Terphenyl-d14 (surr.)	1	%	83	95	109	111
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
α-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
Aldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
β-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
δ-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
γ-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
Toxaphene	1	mg/kg	< 1	-	-	< 1
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
Dibutylchloroendate (surr.)	1	%	117	-	-	133
Tetrachloro-m-xylene (surr.)	1	%	107	-	-	148
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	-	-	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	-	-	< 0.1
Dibutylchloroendate (surr.)	1	%	117	-	-	133
Tetrachloro-m-xylene (surr.)	1	%	107	-	-	148

Client Sample ID			TP1_0.1-0.2	TP1_0.5-0.6	TP2_0.1-0.2	TP2_0.5-0.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Fe29545	S18-Fe29546	S18-Fe29547	S18-Fe29548
Date Sampled			Feb 22, 2018	Feb 22, 2018	Feb 22, 2018	Feb 22, 2018
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	< 2	4.7	10	6.8
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	31	12	24	7.9
Copper	5	mg/kg	46	7.4	18	< 5
Lead	5	mg/kg	< 5	16	19	10.0
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	68	< 5	26	< 5
Zinc	5	mg/kg	41	26	43	< 5
% Moisture	1	%	11	23	16	22

Client Sample ID			DUP1	TRIP1	TP3_0.1-0.2	TP3_1.5-1.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Fe29549	S18-Fe29550	S18-Fe29552	S18-Fe29553
Date Sampled			Feb 22, 2018	Feb 22, 2018	Feb 22, 2018	Feb 22, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	63	74	67	69
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			DUP1	TRIP1	TP3_0.1-0.2	TP3_1.5-1.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Fe29549	S18-Fe29550	S18-Fe29552	S18-Fe29553
Date Sampled			Feb 22, 2018	Feb 22, 2018	Feb 22, 2018	Feb 22, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	0.9	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	0.9	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	1.8	< 0.5
2-Fluorobiphenyl (surr.)	1	%	109	102	102	105
p-Terphenyl-d14 (surr.)	1	%	114	114	101	114
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	-	-
α-BHC	0.05	mg/kg	< 0.05	< 0.05	-	-
Aldrin	0.05	mg/kg	< 0.05	< 0.05	-	-
β-BHC	0.05	mg/kg	< 0.05	< 0.05	-	-
δ-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	-	-
γ-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	-	-
Toxaphene	1	mg/kg	< 1	< 1	-	-
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	-	-
Dibutylchloroendate (surr.)	1	%	117	116	-	-
Tetrachloro-m-xylene (surr.)	1	%	116	120	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	-	-
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	-	-
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	-	-
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	-	-
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	-	-
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	-	-
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	-	-

Client Sample ID Sample Matrix Eurofins mgt Sample No. Date Sampled Test/Reference	LOR	Unit	DUP1 Soil S18-Fe29549 Feb 22, 2018	TRIP1 Soil S18-Fe29550 Feb 22, 2018	TP3_0.1-0.2 Soil S18-Fe29552 Feb 22, 2018	TP3_1.5-1.6 Soil S18-Fe29553 Feb 22, 2018
Polychlorinated Biphenyls						
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	-	-
Dibutylchloroendate (surr.)	1	%	117	116	-	-
Tetrachloro-m-xylene (surr.)	1	%	116	120	-	-
Heavy Metals						
Arsenic	2	mg/kg	11	6.5	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	7.8	9.5	7.0	5.7
Copper	5	mg/kg	< 5	15	5.6	< 5
Lead	5	mg/kg	9.0	52	33	5.7
Mercury	0.1	mg/kg	< 0.1	0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	< 5	63	45	< 5
% Moisture	1	%	22	21	12	14

Client Sample ID Sample Matrix Eurofins mgt Sample No. Date Sampled Test/Reference	LOR	Unit	^{R20} TS1 Soil S18-Fe29554 Feb 22, 2018	TB1 Soil S18-Fe29555 Feb 22, 2018
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene ^{N02}	0.5	mg/kg	83	< 0.5
TRH C6-C10	20	mg/kg	84	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	-	< 20
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	20	mg/kg	84	< 20
BTEX				
Benzene	0.1	mg/kg	80	< 0.1
Toluene	0.1	mg/kg	84	< 0.1
Ethylbenzene	0.1	mg/kg	86	< 0.1
m&p-Xylenes	0.2	mg/kg	84	< 0.2
o-Xylene	0.1	mg/kg	86	< 0.1
Xylenes - Total	0.3	mg/kg	84	< 0.3
4-Bromofluorobenzene (surr.)	1	%	59	102

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 (regarding both quality and NATA accreditation).

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
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Feb 28, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons	Sydney	Feb 27, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Feb 28, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C36			
BTEX	Melbourne	Feb 28, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Eurofins mgt Suite B4			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Feb 28, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Melbourne	Feb 28, 2018	14 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soils by GCMS			
Eurofins mgt Suite B13			
Organochlorine Pesticides	Melbourne	Feb 28, 2018	14 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Melbourne	Feb 28, 2018	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Metals M8	Melbourne	Feb 28, 2018	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Melbourne	Feb 26, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: SOIL ANALYSIS
Project ID: SYDGE241942

Order No.:
Report #: 586434
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Feb 23, 2018 4:41 PM
Due: Mar 2, 2018
Priority: 5 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	HOLD	Metals M8	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X					X	X
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID							
1	TP1_0.1-0.2	Feb 22, 2018		Soil	S18-Fe29545	X		X	X	X	X	
2	TP1_0.5-0.6	Feb 22, 2018		Soil	S18-Fe29546			X		X	X	
3	TP2_0.1-0.2	Feb 22, 2018		Soil	S18-Fe29547	X		X		X	X	
4	TP2_0.5-0.6	Feb 22, 2018		Soil	S18-Fe29548			X	X	X	X	
5	DUP1	Feb 22, 2018		Soil	S18-Fe29549			X	X	X	X	
6	TRIP1	Feb 22, 2018		Soil	S18-Fe29550			X	X	X	X	
7	R1	Feb 22, 2018		Water	S18-Fe29551			X	X		X	
8	TP3_0.1-0.2	Feb 22, 2018		Soil	S18-Fe29552	X		X		X	X	
9	TP3_1.5-1.6	Feb 22, 2018		Soil	S18-Fe29553			X		X	X	

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: SOIL ANALYSIS
Project ID: SYDGE241942

Order No.:
Report #: 586434
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Feb 23, 2018 4:41 PM
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Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	HOLD	Metals M8	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X					X	X
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
10	TS1	Feb 22, 2018		Soil	S18-Fe29554							X
11	TB1	Feb 22, 2018		Soil	S18-Fe29555							X
12	TP1 1.5-1.6	Feb 22, 2018		Soil	S18-Fe29557		X					
13	TP2 1.5-1.6	Feb 22, 2018		Soil	S18-Fe29558		X					
14	TP3 0.5-0.6	Feb 22, 2018		Soil	S18-Fe29559		X					
15	BH1 0.3-0.5	Feb 22, 2018		Soil	S18-Fe29560		X					
16	BH1 1-1.3	Feb 22, 2018		Soil	S18-Fe29561		X					
17	BH1 2.5-2.9	Feb 22, 2018		Soil	S18-Fe29562		X					
18	BH2 0.1-0.2	Feb 22, 2018		Soil	S18-Fe29563		X					
19	BH2 0.4-0.5	Feb 22, 2018		Soil	S18-Fe29564		X					
20	BH2 0.9-1.0	Feb 22, 2018		Soil	S18-Fe29606		X					
21	BH2 1.9-2.0	Feb 22, 2018		Soil	S18-Fe29607		X					

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: SOIL ANALYSIS
Project ID: SYDGE241942

Order No.:
Report #: 586434
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Feb 23, 2018 4:41 PM
Due: Mar 2, 2018
Priority: 5 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	HOLD	Metals M8	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X					X	X
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
22	BH2 2.9-3.0	Feb 22, 2018		Soil	S18-Fe29608		X					
Test Counts						3	11	9	5	8	9	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota 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. 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 Sample Receipt Advice.

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	Quality Systems Manual ver 5.1 US Department of Defense
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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. 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 - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
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							
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							
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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	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 - 2013 NEPM Fractions							
Naphthalene	%	110			70-130	Pass	
TRH C6-C10	%	84			70-130	Pass	
TRH >C10-C16	%	79			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	102			70-130	Pass	
TRH C10-C14	%	87			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	89			70-130	Pass	
Toluene	%	92			70-130	Pass	
Ethylbenzene	%	89			70-130	Pass	
m&p-Xylenes	%	86			70-130	Pass	
Xylenes - Total	%	88			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	86			70-130	Pass	
Acenaphthylene	%	89			70-130	Pass	
Anthracene	%	118			70-130	Pass	
Benz(a)anthracene	%	73			70-130	Pass	
Benzo(a)pyrene	%	84			70-130	Pass	
Benzo(b&j)fluoranthene	%	79			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(g,h,i)perylene			%	73			70-130	Pass	
Benzo(k)fluoranthene			%	83			70-130	Pass	
Chrysene			%	117			70-130	Pass	
Dibenz(a,h)anthracene			%	75			70-130	Pass	
Fluoranthene			%	87			70-130	Pass	
Fluorene			%	94			70-130	Pass	
Indeno(1,2,3-cd)pyrene			%	78			70-130	Pass	
Naphthalene			%	82			70-130	Pass	
Phenanthrene			%	74			70-130	Pass	
Pyrene			%	89			70-130	Pass	
LCS - % Recovery									
Organochlorine Pesticides									
4,4'-DDD			%	104			70-130	Pass	
4,4'-DDE			%	106			70-130	Pass	
4,4'-DDT			%	119			70-130	Pass	
a-BHC			%	94			70-130	Pass	
Aldrin			%	101			70-130	Pass	
b-BHC			%	91			70-130	Pass	
d-BHC			%	93			70-130	Pass	
Dieldrin			%	105			70-130	Pass	
Endosulfan I			%	103			70-130	Pass	
Endosulfan II			%	98			70-130	Pass	
Endosulfan sulphate			%	103			70-130	Pass	
Endrin			%	113			70-130	Pass	
Endrin aldehyde			%	93			70-130	Pass	
Endrin ketone			%	102			70-130	Pass	
g-BHC (Lindane)			%	92			70-130	Pass	
Heptachlor			%	102			70-130	Pass	
Heptachlor epoxide			%	102			70-130	Pass	
Hexachlorobenzene			%	90			70-130	Pass	
Methoxychlor			%	126			70-130	Pass	
LCS - % Recovery									
Polychlorinated Biphenyls									
Aroclor-1260			%	85			70-130	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic			%	84			80-120	Pass	
Cadmium			%	89			80-120	Pass	
Chromium			%	93			80-120	Pass	
Copper			%	91			80-120	Pass	
Lead			%	93			80-120	Pass	
Mercury			%	100			75-125	Pass	
Nickel			%	92			80-120	Pass	
Zinc			%	88			80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M18-Fe27629	NCP	%	83			70-130	Pass	
Acenaphthylene	M18-Fe27629	NCP	%	90			70-130	Pass	
Anthracene	M18-Fe27629	NCP	%	97			70-130	Pass	
Benz(a)anthracene	M18-Fe27629	NCP	%	79			70-130	Pass	
Benzo(a)pyrene	M18-Fe27629	NCP	%	74			70-130	Pass	
Benzo(b&j)fluoranthene	M18-Fe27629	NCP	%	81			70-130	Pass	
Benzo(g,h,i)perylene	M18-Fe27629	NCP	%	72			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(k)fluoranthene	M18-Fe27629	NCP	%	70			70-130	Pass	
Chrysene	M18-Fe27629	NCP	%	91			70-130	Pass	
Dibenz(a,h)anthracene	M18-Fe27629	NCP	%	85			70-130	Pass	
Fluoranthene	M18-Fe27629	NCP	%	83			70-130	Pass	
Fluorene	M18-Fe27629	NCP	%	87			70-130	Pass	
Indeno(1,2,3-cd)pyrene	M18-Fe27629	NCP	%	86			70-130	Pass	
Naphthalene	M18-Fe27629	NCP	%	86			70-130	Pass	
Phenanthrene	M18-Fe27629	NCP	%	85			70-130	Pass	
Pyrene	M18-Fe27629	NCP	%	84			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4,4'-DDD	M18-Fe30304	NCP	%	111			70-130	Pass	
4,4'-DDE	M18-Fe30304	NCP	%	102			70-130	Pass	
4,4'-DDT	M18-Fe30304	NCP	%	112			70-130	Pass	
a-BHC	M18-Fe30304	NCP	%	90			70-130	Pass	
Aldrin	M18-Fe30304	NCP	%	97			70-130	Pass	
b-BHC	M18-Fe30304	NCP	%	88			70-130	Pass	
d-BHC	M18-Fe30304	NCP	%	91			70-130	Pass	
Dieldrin	M18-Fe30304	NCP	%	125			70-130	Pass	
Endosulfan I	M18-Fe30304	NCP	%	98			70-130	Pass	
Endosulfan II	M18-Fe30304	NCP	%	98			70-130	Pass	
Endosulfan sulphate	M18-Fe30304	NCP	%	106			70-130	Pass	
Endrin	M18-Fe30304	NCP	%	126			70-130	Pass	
Endrin aldehyde	M18-Fe30304	NCP	%	87			70-130	Pass	
Endrin ketone	M18-Fe30304	NCP	%	101			70-130	Pass	
g-BHC (Lindane)	M18-Fe30304	NCP	%	92			70-130	Pass	
Heptachlor	M18-Fe30304	NCP	%	108			70-130	Pass	
Heptachlor epoxide	M18-Fe30304	NCP	%	100			70-130	Pass	
Hexachlorobenzene	M18-Fe30304	NCP	%	87			70-130	Pass	
Methoxychlor	M18-Fe28856	NCP	%	126			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	M18-Fe28153	NCP	%	79			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S18-Fe29550	CP	%	77			70-130	Pass	
TRH C6-C10	S18-Fe29550	CP	%	72			70-130	Pass	
TRH >C10-C16	S18-Fe29550	CP	%	71			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S18-Fe29550	CP	%	71			70-130	Pass	
TRH C10-C14	S18-Fe29550	CP	%	79			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S18-Fe29550	CP	%	75			70-130	Pass	
Toluene	S18-Fe29550	CP	%	83			70-130	Pass	
Ethylbenzene	S18-Fe29550	CP	%	90			70-130	Pass	
m&p-Xylenes	S18-Fe29550	CP	%	90			70-130	Pass	
o-Xylene	S18-Fe29550	CP	%	90			70-130	Pass	
Xylenes - Total	S18-Fe29550	CP	%	90			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S18-Fe29552	CP	%	96			75-125	Pass	
Cadmium	S18-Fe29552	CP	%	94			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Chromium	S18-Fe29552	CP	%	101			75-125	Pass	
Copper	S18-Fe29552	CP	%	103			75-125	Pass	
Lead	S18-Fe29552	CP	%	109			75-125	Pass	
Mercury	S18-Fe29552	CP	%	104			70-130	Pass	
Nickel	S18-Fe29552	CP	%	95			75-125	Pass	
Zinc	S18-Fe29552	CP	%	89			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	B18-Ma01105	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	B18-Ma01105	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	B18-Ma01105	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	B18-Ma01105	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	B18-Ma01105	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&i)fluoranthene	B18-Ma01105	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g,h,i)perylene	B18-Ma01105	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	B18-Ma01105	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	B18-Ma01105	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a,h)anthracene	B18-Ma01105	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	B18-Ma01105	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	B18-Ma01105	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1,2,3-cd)pyrene	B18-Ma01105	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	B18-Ma01105	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	B18-Ma01105	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	B18-Ma01105	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S18-Fe29548	CP	%	22	22	2.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S18-Fe29549	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S18-Fe29549	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S18-Fe29549	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S18-Fe29549	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S18-Fe29549	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S18-Fe29549	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S18-Fe29549	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S18-Fe29549	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S18-Fe29549	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S18-Fe29549	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S18-Fe29549	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S18-Fe29549	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S18-Fe29549	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S18-Fe29549	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S18-Fe29549	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	

Duplicate								
Organochlorine Pesticides				Result 1	Result 2	RPD		
Chlordanes - Total	S18-Fe29550	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
4,4'-DDD	S18-Fe29550	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4,4'-DDE	S18-Fe29550	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4,4'-DDT	S18-Fe29550	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
a-BHC	S18-Fe29550	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Aldrin	S18-Fe29550	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
b-BHC	S18-Fe29550	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
d-BHC	S18-Fe29550	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Dieldrin	S18-Fe29550	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan I	S18-Fe29550	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan II	S18-Fe29550	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan sulphate	S18-Fe29550	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin	S18-Fe29550	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin aldehyde	S18-Fe29550	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin ketone	S18-Fe29550	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
g-BHC (Lindane)	S18-Fe29550	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor	S18-Fe29550	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor epoxide	S18-Fe29550	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Hexachlorobenzene	S18-Fe29550	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Methoxychlor	S18-Fe29550	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Toxaphene	S18-Fe29550	CP	mg/kg	< 1	< 1	<1	30%	Pass
Duplicate								
Polychlorinated Biphenyls				Result 1	Result 2	RPD		
Aroclor-1016	S18-Fe29550	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1221	S18-Fe29550	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1232	S18-Fe29550	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1242	S18-Fe29550	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1248	S18-Fe29550	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1254	S18-Fe29550	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1260	S18-Fe29550	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Total PCB*	S18-Fe29550	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	S18-Fe29550	CP	mg/kg	6.5	6.3	4.0	30%	Pass
Cadmium	S18-Fe29550	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	S18-Fe29550	CP	mg/kg	9.5	12	24	30%	Pass
Copper	S18-Fe29550	CP	mg/kg	15	26	54	30%	Fail Q15
Lead	S18-Fe29550	CP	mg/kg	52	85	48	30%	Fail Q15
Mercury	S18-Fe29550	CP	mg/kg	0.1	0.2	4.0	30%	Pass
Nickel	S18-Fe29550	CP	mg/kg	< 5	< 5	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Cadmium	S18-Fe29552	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	S18-Fe29552	CP	mg/kg	7.0	7.1	2.0	30%	Pass
Copper	S18-Fe29552	CP	mg/kg	5.6	5.8	3.0	30%	Pass
Lead	S18-Fe29552	CP	mg/kg	33	33	<1	30%	Pass
Mercury	S18-Fe29552	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Nickel	S18-Fe29552	CP	mg/kg	< 5	< 5	<1	30%	Pass
Zinc	S18-Fe29552	CP	mg/kg	45	44	1.0	30%	Pass

Comments

Sample Integrity

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

Comments

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
Q15	The RPD reported passes Eurofins mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.
R20	This sample is a Trip Spike and therefore all results are reported as a percentage

Authorised By

Nibha Vaidya	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)
Michael Brancati	Senior Analyst-Inorganic (VIC)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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Certificate of Analysis

Coffey Environments Pty Ltd NSW
Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Simon Hay

Report 586434-W
Project name SOIL ANALYSIS
Project ID SYDGE241942
Received Date Feb 23, 2018

Client Sample ID			R1
Sample Matrix			Water
Eurofins mgt Sample No.			S18-Fe29551
Date Sampled			Feb 22, 2018
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	0.02	mg/L	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1
TRH C10-36 (Total)	0.1	mg/L	< 0.1
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003
4-Bromofluorobenzene (surr.)	1	%	116
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene ^{N02}	0.01	mg/L	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1
Polycyclic Aromatic Hydrocarbons			
Acenaphthene	0.001	mg/L	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001
Anthracene	0.001	mg/L	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001
Chrysene	0.001	mg/L	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001
Fluoranthene	0.001	mg/L	< 0.001
Fluorene	0.001	mg/L	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001

Client Sample ID			R1
Sample Matrix			Water
Eurofins mgt Sample No.			S18-Fe29551
Date Sampled			Feb 22, 2018
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Naphthalene	0.001	mg/L	< 0.001
Phenanthrene	0.001	mg/L	< 0.001
Pyrene	0.001	mg/L	< 0.001
Total PAH*	0.001	mg/L	< 0.001
2-Fluorobiphenyl (surr.)	1	%	67
p-Terphenyl-d14 (surr.)	1	%	95
Organochlorine Pesticides			
Chlordanes - Total	0.001	mg/L	< 0.001
4,4'-DDD	0.0001	mg/L	< 0.0001
4,4'-DDE	0.0001	mg/L	< 0.0001
4,4'-DDT	0.0001	mg/L	< 0.0001
a-BHC	0.0001	mg/L	< 0.0001
Aldrin	0.0001	mg/L	< 0.0001
b-BHC	0.0001	mg/L	< 0.0001
d-BHC	0.0001	mg/L	< 0.0001
Dieldrin	0.0001	mg/L	< 0.0001
Endosulfan I	0.0001	mg/L	< 0.0001
Endosulfan II	0.0001	mg/L	< 0.0001
Endosulfan sulphate	0.0001	mg/L	< 0.0001
Endrin	0.0001	mg/L	< 0.0001
Endrin aldehyde	0.0001	mg/L	< 0.0001
Endrin ketone	0.0001	mg/L	< 0.0001
g-BHC (Lindane)	0.0001	mg/L	< 0.0001
Heptachlor	0.0001	mg/L	< 0.0001
Heptachlor epoxide	0.0001	mg/L	< 0.0001
Hexachlorobenzene	0.0001	mg/L	< 0.0001
Methoxychlor	0.0001	mg/L	< 0.0001
Toxaphene	0.01	mg/L	< 0.01
Aldrin and Dieldrin (Total)*	0.0001	mg/L	< 0.0001
DDT + DDE + DDD (Total)*	0.0001	mg/L	< 0.0001
Vic EPA IWRG 621 OCP (Total)*	0.001	mg/L	< 0.001
Vic EPA IWRG 621 Other OCP (Total)*	0.001	mg/L	< 0.001
Dibutylchloroendate (surr.)	1	%	121
Tetrachloro-m-xylene (surr.)	1	%	71
Polychlorinated Biphenyls			
Aroclor-1016	0.001	mg/L	< 0.001
Aroclor-1221	0.001	mg/L	< 0.001
Aroclor-1232	0.001	mg/L	< 0.001
Aroclor-1242	0.001	mg/L	< 0.001
Aroclor-1248	0.001	mg/L	< 0.001
Aroclor-1254	0.001	mg/L	< 0.001
Aroclor-1260	0.001	mg/L	< 0.001
Total PCB*	0.001	mg/L	< 0.001
Dibutylchloroendate (surr.)	1	%	121
Tetrachloro-m-xylene (surr.)	1	%	71

Client Sample ID			R1
Sample Matrix			Water
Eurofins mgt Sample No.			S18-Fe29551
Date Sampled			Feb 22, 2018
Test/Reference	LOR	Unit	
Heavy Metals			
Arsenic	0.001	mg/L	< 0.001
Cadmium	0.0002	mg/L	< 0.0002
Chromium	0.001	mg/L	< 0.001
Copper	0.001	mg/L	< 0.001
Lead	0.001	mg/L	< 0.001
Mercury	0.0001	mg/L	< 0.0001
Nickel	0.001	mg/L	< 0.001
Zinc	0.005	mg/L	0.008

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 (regarding both quality and NATA accreditation).

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
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C36	Melbourne	Feb 27, 2018	7 Day
BTEX - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Feb 27, 2018	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Feb 27, 2018	7 Day
Eurofins mgt Suite B4			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Feb 27, 2018	7 Day
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Water by GCMS	Melbourne	Feb 27, 2018	7 Day
Eurofins mgt Suite B13			
Organochlorine Pesticides - Method: LTM-ORG-2220 OCP & PCB in Soil and Water	Melbourne	Feb 27, 2018	7 Day
Polychlorinated Biphenyls - Method: LTM-ORG-2220 OCP & PCB in Soil and Water	Melbourne	Feb 27, 2018	7 Days
Metals M8 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Feb 27, 2018	28 Days

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: SOIL ANALYSIS
Project ID: SYDGE241942

Order No.:
Report #: 586434
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Feb 23, 2018 4:41 PM
Due: Mar 2, 2018
Priority: 5 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	HOLD	Metals M8	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X					X	X
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID							
1	TP1_0.1-0.2	Feb 22, 2018		Soil	S18-Fe29545	X		X	X	X	X	
2	TP1_0.5-0.6	Feb 22, 2018		Soil	S18-Fe29546			X		X	X	
3	TP2_0.1-0.2	Feb 22, 2018		Soil	S18-Fe29547	X		X		X	X	
4	TP2_0.5-0.6	Feb 22, 2018		Soil	S18-Fe29548			X	X	X	X	
5	DUP1	Feb 22, 2018		Soil	S18-Fe29549			X	X	X	X	
6	TRIP1	Feb 22, 2018		Soil	S18-Fe29550			X	X	X	X	
7	R1	Feb 22, 2018		Water	S18-Fe29551			X	X		X	
8	TP3_0.1-0.2	Feb 22, 2018		Soil	S18-Fe29552	X		X		X	X	
9	TP3_1.5-1.6	Feb 22, 2018		Soil	S18-Fe29553			X		X	X	

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Sample Detail						Asbestos - AS4964	HOLD	Metals M8	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X					X	X
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
10	TS1	Feb 22, 2018		Soil	S18-Fe29554							X
11	TB1	Feb 22, 2018		Soil	S18-Fe29555							X
12	TP1 1.5-1.6	Feb 22, 2018		Soil	S18-Fe29557		X					
13	TP2 1.5-1.6	Feb 22, 2018		Soil	S18-Fe29558		X					
14	TP3 0.5-0.6	Feb 22, 2018		Soil	S18-Fe29559		X					
15	BH1 0.3-0.5	Feb 22, 2018		Soil	S18-Fe29560		X					
16	BH1 1-1.3	Feb 22, 2018		Soil	S18-Fe29561		X					
17	BH1 2.5-2.9	Feb 22, 2018		Soil	S18-Fe29562		X					
18	BH2 0.1-0.2	Feb 22, 2018		Soil	S18-Fe29563		X					
19	BH2 0.4-0.5	Feb 22, 2018		Soil	S18-Fe29564		X					
20	BH2 0.9-1.0	Feb 22, 2018		Soil	S18-Fe29606		X					
21	BH2 1.9-2.0	Feb 22, 2018		Soil	S18-Fe29607		X					

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Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	HOLD	Metals M8	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X					X	X
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
22	BH2 2.9-3.0	Feb 22, 2018		Soil	S18-Fe29608		X					
Test Counts						3	11	9	5	8	9	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota 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. 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 Sample Receipt Advice.

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	Quality Systems Manual ver 5.1 US Department of Defense
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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. 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/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g,h,i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a,h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1,2,3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/L	< 0.001			0.001	Pass	
4,4'-DDD	mg/L	< 0.0001			0.0001	Pass	
4,4'-DDE	mg/L	< 0.0001			0.0001	Pass	
4,4'-DDT	mg/L	< 0.0001			0.0001	Pass	
a-BHC	mg/L	< 0.0001			0.0001	Pass	
Aldrin	mg/L	< 0.0001			0.0001	Pass	
b-BHC	mg/L	< 0.0001			0.0001	Pass	
d-BHC	mg/L	< 0.0001			0.0001	Pass	
Dieldrin	mg/L	< 0.0001			0.0001	Pass	
Endosulfan I	mg/L	< 0.0001			0.0001	Pass	
Endosulfan II	mg/L	< 0.0001			0.0001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/L	< 0.0001			0.0001	Pass	
Endrin	mg/L	< 0.0001			0.0001	Pass	
Endrin aldehyde	mg/L	< 0.0001			0.0001	Pass	
Endrin ketone	mg/L	< 0.0001			0.0001	Pass	
g-BHC (Lindane)	mg/L	< 0.0001			0.0001	Pass	
Heptachlor	mg/L	< 0.0001			0.0001	Pass	
Heptachlor epoxide	mg/L	< 0.0001			0.0001	Pass	
Hexachlorobenzene	mg/L	< 0.0001			0.0001	Pass	
Methoxychlor	mg/L	< 0.0001			0.0001	Pass	
Toxaphene	mg/L	< 0.01			0.01	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/L	< 0.001			0.001	Pass	
Aroclor-1221	mg/L	< 0.001			0.001	Pass	
Aroclor-1232	mg/L	< 0.001			0.001	Pass	
Aroclor-1242	mg/L	< 0.001			0.001	Pass	
Aroclor-1248	mg/L	< 0.001			0.001	Pass	
Aroclor-1254	mg/L	< 0.001			0.001	Pass	
Aroclor-1260	mg/L	< 0.001			0.001	Pass	
Total PCB*	mg/L	< 0.0001			0.001	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	122			70-130	Pass	
TRH C10-C14	%	85			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	112			70-130	Pass	
Toluene	%	111			70-130	Pass	
Ethylbenzene	%	109			70-130	Pass	
m&p-Xylenes	%	109			70-130	Pass	
Xylenes - Total	%	109			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	116			70-130	Pass	
TRH C6-C10	%	124			70-130	Pass	
TRH >C10-C16	%	76			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	80			70-130	Pass	
Acenaphthylene	%	86			70-130	Pass	
Anthracene	%	74			70-130	Pass	
Benz(a)anthracene	%	96			70-130	Pass	
Benzo(a)pyrene	%	92			70-130	Pass	
Benzo(b&j)fluoranthene	%	101			70-130	Pass	

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(g,h,i)perylene				%	97			70-130	Pass	
Benzo(k)fluoranthene				%	105			70-130	Pass	
Chrysene				%	90			70-130	Pass	
Dibenz(a,h)anthracene				%	123			70-130	Pass	
Fluoranthene				%	95			70-130	Pass	
Fluorene				%	79			70-130	Pass	
Indeno(1,2,3-cd)pyrene				%	104			70-130	Pass	
Naphthalene				%	93			70-130	Pass	
Phenanthrene				%	85			70-130	Pass	
Pyrene				%	94			70-130	Pass	
LCS - % Recovery										
Organochlorine Pesticides										
Chlordanes - Total				%	122			70-130	Pass	
4,4'-DDD				%	117			70-130	Pass	
4,4'-DDE				%	99			70-130	Pass	
4,4'-DDT				%	124			70-130	Pass	
a-BHC				%	90			70-130	Pass	
Aldrin				%	89			70-130	Pass	
b-BHC				%	92			70-130	Pass	
d-BHC				%	106			70-130	Pass	
Dieldrin				%	94			70-130	Pass	
Endosulfan I				%	100			70-130	Pass	
Endosulfan II				%	103			70-130	Pass	
Endosulfan sulphate				%	116			70-130	Pass	
Endrin				%	125			70-130	Pass	
Endrin aldehyde				%	123			70-130	Pass	
Endrin ketone				%	127			70-130	Pass	
g-BHC (Lindane)				%	91			70-130	Pass	
Heptachlor				%	126			70-130	Pass	
Heptachlor epoxide				%	86			70-130	Pass	
Hexachlorobenzene				%	109			70-130	Pass	
Methoxychlor				%	118			70-130	Pass	
LCS - % Recovery										
Heavy Metals										
Arsenic				%	109			80-120	Pass	
Cadmium				%	104			80-120	Pass	
Chromium				%	105			80-120	Pass	
Copper				%	101			80-120	Pass	
Lead				%	101			80-120	Pass	
Mercury				%	104			75-125	Pass	
Nickel				%	103			80-120	Pass	
Zinc				%	112			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 C10-C14	M18-Fe25550	NCP	%		77			70-130	Pass	
Spike - % Recovery										
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					Result 1					
TRH >C10-C16	M18-Fe25550	NCP	%		70			70-130	Pass	
Spike - % Recovery										
Polycyclic Aromatic Hydrocarbons					Result 1					
Acenaphthene	S18-Fe27760	NCP	%		71			70-130	Pass	
Acenaphthylene	S18-Fe27760	NCP	%		77			70-130	Pass	
Anthracene	S18-Fe27760	NCP	%		71			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benz(a)anthracene	S18-Fe27760	NCP	%	93			70-130	Pass	
Benzo(a)pyrene	S18-Fe27760	NCP	%	70			70-130	Pass	
Benzo(b&j)fluoranthene	S18-Fe27760	NCP	%	77			70-130	Pass	
Benzo(g,h,i)perylene	S18-Fe27760	NCP	%	75			70-130	Pass	
Benzo(k)fluoranthene	S18-Fe27760	NCP	%	89			70-130	Pass	
Chrysene	S18-Fe27760	NCP	%	72			70-130	Pass	
Dibenz(a,h)anthracene	S18-Fe27760	NCP	%	96			70-130	Pass	
Fluoranthene	S18-Fe27760	NCP	%	94			70-130	Pass	
Fluorene	S18-Fe27760	NCP	%	74			70-130	Pass	
Indeno(1,2,3-cd)pyrene	S18-Fe27760	NCP	%	91			70-130	Pass	
Naphthalene	M18-Fe28561	NCP	%	79			70-130	Pass	
Phenanthrene	S18-Fe27760	NCP	%	77			70-130	Pass	
Pyrene	S18-Fe27760	NCP	%	90			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	M18-Fe28627	NCP	%	84			70-130	Pass	
4,4'-DDD	M18-Fe28627	NCP	%	126			70-130	Pass	
4,4'-DDE	M18-Fe28627	NCP	%	76			70-130	Pass	
4,4'-DDT	M18-Fe28627	NCP	%	118			70-130	Pass	
a-BHC	M18-Fe28627	NCP	%	85			70-130	Pass	
Aldrin	M18-Fe28627	NCP	%	77			70-130	Pass	
b-BHC	M18-Fe28627	NCP	%	92			70-130	Pass	
d-BHC	M18-Fe28627	NCP	%	89			70-130	Pass	
Dieldrin	M18-Fe28627	NCP	%	88			70-130	Pass	
Endosulfan I	M18-Fe28627	NCP	%	88			70-130	Pass	
Endosulfan II	M18-Fe28627	NCP	%	106			70-130	Pass	
Endosulfan sulphate	M18-Fe28627	NCP	%	108			70-130	Pass	
Endrin	M18-Fe28627	NCP	%	129			70-130	Pass	
Endrin aldehyde	M18-Fe28627	NCP	%	106			70-130	Pass	
Endrin ketone	M18-Fe28561	NCP	%	102			70-130	Pass	
g-BHC (Lindane)	M18-Fe28627	NCP	%	80			70-130	Pass	
Heptachlor	M18-Fe28627	NCP	%	108			70-130	Pass	
Heptachlor epoxide	M18-Fe28627	NCP	%	95			70-130	Pass	
Hexachlorobenzene	M18-Fe28627	NCP	%	77			70-130	Pass	
Methoxychlor	M18-Fe28627	NCP	%	107			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M18-Fe27341	NCP	%	110			75-125	Pass	
Cadmium	M18-Fe27341	NCP	%	107			75-125	Pass	
Chromium	M18-Fe27341	NCP	%	106			75-125	Pass	
Copper	M18-Fe27341	NCP	%	104			75-125	Pass	
Lead	M18-Fe27341	NCP	%	107			75-125	Pass	
Mercury	M18-Fe27341	NCP	%	110			70-130	Pass	
Nickel	M18-Fe27341	NCP	%	105			75-125	Pass	
Zinc	M18-Fe27341	NCP	%	111			75-125	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 C10-C14	S18-Fe24345	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	S18-Fe24345	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	S18-Fe24345	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	

Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
TRH >C10-C16	S18-Fe24345	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass
TRH >C16-C34	S18-Fe24345	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass
TRH >C34-C40	S18-Fe24345	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass
Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Acenaphthene	M18-Fe28626	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Acenaphthylene	M18-Fe28626	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Anthracene	M18-Fe28626	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benz(a)anthracene	M18-Fe28626	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(a)pyrene	M18-Fe28626	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(b&j)fluoranthene	M18-Fe28626	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(g,h,i)perylene	M18-Fe28626	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(k)fluoranthene	M18-Fe28626	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Chrysene	M18-Fe28626	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Dibenz(a,h)anthracene	M18-Fe28626	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Fluoranthene	M18-Fe28626	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Fluorene	M18-Fe28626	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	M18-Fe28626	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Naphthalene	M18-Fe28626	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Phenanthrene	M18-Fe28626	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Pyrene	M18-Fe28626	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Duplicate								
Organochlorine Pesticides				Result 1	Result 2	RPD		
Chlordanes - Total	M18-Fe28626	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
4,4'-DDD	M18-Fe28626	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
4,4'-DDE	M18-Fe28626	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
4,4'-DDT	M18-Fe28626	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
a-BHC	M18-Fe28626	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Aldrin	M18-Fe28626	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
b-BHC	M18-Fe28626	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
d-BHC	M18-Fe28626	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Dieldrin	M18-Fe28626	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Endosulfan I	M18-Fe28626	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Endosulfan II	M18-Fe28626	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Endosulfan sulphate	M18-Fe28626	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Endrin	M18-Fe28626	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Endrin aldehyde	M18-Fe28626	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Endrin ketone	M18-Fe28626	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
g-BHC (Lindane)	M18-Fe28626	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Heptachlor	M18-Fe28626	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Heptachlor epoxide	M18-Fe28626	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Hexachlorobenzene	M18-Fe28626	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Methoxychlor	M18-Fe28626	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Toxaphene	M18-Fe28626	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass
Duplicate								
Polychlorinated Biphenyls				Result 1	Result 2	RPD		
Aroclor-1016	M18-Fe28626	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Aroclor-1221	M18-Fe28626	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Aroclor-1232	M18-Fe28626	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Aroclor-1242	M18-Fe28626	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Aroclor-1248	M18-Fe28626	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Aroclor-1254	M18-Fe28626	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Aroclor-1260	M18-Fe28626	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Total PCB*	M18-Fe28626	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass

Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M18-Fe27341	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Cadmium	M18-Fe27341	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass
Chromium	M18-Fe27341	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Copper	M18-Fe27341	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Lead	M18-Fe27341	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Mercury	M18-Fe27341	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Nickel	M18-Fe27341	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Zinc	M18-Fe27341	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass

Comments

Sample Integrity

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

Comments

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

Authorised By

Nibha Vaidya	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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coffey environments SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE		Consigning Office: Chatswood		Report Results to: Simon Hay		Mobile: 0424 703 009	Email: simon.hay@coffey.com											
		Invoices to: Simon Hay		Phone: _____		Email: luke.steller@coffey.com												
Project No: SYDGE214942		Task No: _____		Analysis Request Section NOTES														
Project Name: Mann St Gosford		Laboratory: Eurofins																
Sampler's Name: Lily		Project Manager: Simon Hay																
Special Instructions: _____		See Notes																
Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	Suite B4 (TRH, BTEX, PAH)	Suite M8 (Metals)	Suite B13 (OCP, PCB)	pH Fieldscreen (pH & pHox)	SPOCAS	TRH (C6-C10) & BTEX	Asbestos	Hold				
	BH3_0.6-1.0	#####		Soil	Jar		X	X	X				X					
	BH3_1.9-2.0	#####		Soil	Jar		X	X		X								
	BH3_2.45-2.70	#####		Soil	Jar					X								
	BH3_2.75-3.0	#####		Soil	Jar					X								
	TS2	#####			Vial							X						
	TB2	#####			Vial							X						
Samples to be analysed on a 5 day TAT for Suites B4, M8, B13, asbestos and TRH C6-C10 + BTEX. Please conduct pH field Screen on 1 day TAT only																		
RELINQUISHED BY						RECEIVED BY						Sample Receipt Advice: (Lab Use Only)						
Name: Lily Parchizadeh		Date: 23/02/2018		Name:		Date: 26/2		All Samples Received in Good Condition ☐										
Coffey Environments		Time: _____		Company: _____		Time: _____		All Documentation is in Proper Order ☐										
Name: _____		Date: _____		Name: _____		Date: _____		Samples Received Properly Chilled ☐										
Company: _____		Time: _____		Company: _____		Time: _____		Lab. Ref/Batch No. 586384										
*Container Type & Preservation Codes: P - Plastic, G- Glass Bottle, J - Glass Jar, V- Vial, Z - Ziplock bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative																		

Enviro Sample NSW

From: Hay, Simon <Simon.Hay@coffey.com>
Sent: Monday, 26 February 2018 2:09 PM
To: Enviro Sample NSW
Cc: Steller, Luke; Nibha Vaidya
Subject: sample scheduling
Attachments: 586384_sample_receipt_coc.pdf; 586384_summary.pdf; 23022017 Chain of Custody Form Electronic.xlsx

Follow Up Flag: Follow up
Flag Status: Flagged

Hi there,

Can I schedule analysis of these samples as per the attached COC. Can you please conduct pH field screen on 1 day TAT – all other analytes to be analysed on standard TAT.

Thanks very much and Kind Regards,

Simon Hay
Environmental Scientist

Level 20, Tower B - Citadel Tower
799 Pacific Highway Chatswood NSW 2067

t: +61 2 9406 1060
f: +61 2 9406 1002
m: 0424 703 009
w: coffey.com



>>> Ingenuity@coffey – it's the ideas that count

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Sample Receipt Advice

Company name: **Coffey Environments Pty Ltd NSW**

Contact name: Simon Hay
Project name: MANN ST GOSFORD
Project ID: SYDGE214942
COC number: Not provided
Turn around time: 1 Day
Date/Time received: Feb 23, 2018 6:49 PM
Eurofins | mgt reference: **586584**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt
Sample Receipt : 21.4 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

BH3_2.45-2.70 bag not received - pHf*fox cancelled. BH3_0.6-1.0 bag received placed on hold.

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Simon Hay - simon.hay@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Environments Pty Ltd NSW email address.

Certificate of Analysis

Coffey Environments Pty Ltd NSW
Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: **Simon Hay**

Report **586584-S**
 Project name MANN ST GOSFORD
 Project ID SYDGE214942
 Received Date Feb 23, 2018

Client Sample ID			BH3_2.75-3.0	BH3_1.9-2.0
Sample Matrix			Soil	Soil
Eurofins mgt Sample No.			S18-Fe29240	S18-Fe29988
Date Sampled			Feb 23, 2018	Feb 23, 2018
Test/Reference	LOR	Unit		
Acid Sulfate Soils Field pH Test				
pH-F (Field pH test)*	0.1	pH Units	5.9	8.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.2	5.2
Reaction Ratings* ^{S05}		comment	4.0	3.0

Sample History

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

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

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

Acid Sulfate Soils Field pH Test

Testing Site

Sydney

Extracted

Feb 27, 2018

Holding Time

7 Days

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

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: MANN ST GOSFORD
Project ID: SYDGE214942

Order No.:
Report #: 586584
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Feb 23, 2018 6:49 PM
Due: Feb 27, 2018
Priority: 1 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						CANCELLED	HOLD	Acid Sulfate Soils Field pH Test
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	BH3 2.45-2.70	Feb 23, 2018		Soil	S18-Fe29239	X		
2	BH3 2.75-3.0	Feb 23, 2018		Soil	S18-Fe29240			X
3	BH3 1.9-2.0	Feb 23, 2018		Soil	S18-Fe29988			X
4	BH3 0.6-1.0	Feb 23, 2018		Soil	S18-Fe29991		X	
Test Counts						1	1	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota 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. 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 Sample Receipt Advice.

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.

****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	Quality Systems Manual ver 5.1 US Department of Defense
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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. 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.

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

Comments

Qualifier Codes/Comments

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

Authorised By

Nibha Vaidya Analytical Services Manager



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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Enviro Sample NSW

From: Nibha Vaidya
Sent: Wednesday, 28 February 2018 11:36 AM
To: Enviro Sample NSW; COC NSW
Subject: 5 DAY TAT - FW: Eurofins | mgt Test Results, Invoice - Report 586584 : Site MANN ST GOSFORD (SYDGE214942)

Follow Up Flag: Follow up
Flag Status: Flagged

Additional SPOCAS please – 5 day TAT

Kind Regards,

Nibha Vaidya
Phone : +61 2 9900 8415
Mobile : +61 499 900 805
Email : NibhaVaidya@eurofins.com

From: Hay, Simon [<mailto:Simon.Hay@coffey.com>]
Sent: Wednesday, 28 February 2018 8:54 AM
To: Asim Khan
Cc: Enviro Sample NSW; Nibha Vaidya
Subject: RE: Eurofins | mgt Test Results, Invoice - Report 586584 : Site MANN ST GOSFORD (SYDGE214942)

EXTERNAL EMAIL*

Hi Asim,

Can I please schedule in sample BH3_2.75-3.0 for SPOCAS testing on a standard turn around please?

Thanks very much

Simon

From: AsimKhan@eurofins.com [<mailto:AsimKhan@eurofins.com>]
Sent: Tuesday, February 27, 2018 6:37 PM
To: Hay, Simon <Simon.Hay@coffey.com>
Subject: Eurofins | mgt Test Results, Invoice - Report 586584 : Site MANN ST GOSFORD (SYDGE214942)

Dear Simon,

Please find attached results and invoice for your project in the subject header.

Kind regards,

Asim Khan
Analytical Services Manager

Eurofins | mgt

Unit F3, Parkview Building
16 Mars Road
LANE COVE WEST NSW 2066
AUSTRALIA
Phone : +61 2 9900 8432
Email : AsimKhan@eurofins.com
Website : www.eurofins.com.au/environmental-testing

[EnviroNote 1074 - Passive Samplers for VOCs in Air](#)

Click [here](#) to report this email as spam.

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* WARNING - EXTERNAL: This email originated from outside of Eurofins. Do not click any links or open any attachments unless you trust the sender and know that the content is safe!

Sample Receipt Advice

Company name: **Coffey Environments Pty Ltd NSW**
Contact name: **Simon Hay**
Project name: **ADDITIONAL - MANN ST GOSFORD**
Project ID: **SYDGE214942**
COC number: **Not provided**
Turn around time: **5 Day**
Date/Time received: **Feb 28, 2018 11:36 AM**
Eurofins | mgt reference: **586943**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 21.4 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Simon Hay - simon.hay@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Environments Pty Ltd NSW email address.

Certificate of Analysis

Coffey Environments Pty Ltd NSW
Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Simon Hay

Report 586943-S
Project name ADDITIONAL - MANN ST GOSFORD
Project ID SYDGE214942
Received Date Feb 28, 2018

Client Sample ID			BH3_2.75-3.0
Sample Matrix			Soil
Eurofins mgt Sample No.			S18-Fe32467
Date Sampled			Feb 23, 2018
Test/Reference	LOR	Unit	
SPOCAS Suite			
pH-KCL	0.1	pH Units	4.3
pH-OX	0.1	pH Units	5.0
Acid trail - Titratable Actual Acidity	2	mol H+/t	32
Acid trail - Titratable Peroxide Acidity	2	mol H+/t	30
Acid trail - Titratable Sulfidic Acidity	2	mol H+/t	< 2
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.05
sulfidic - TPA equiv. S% pyrite	0.02	% pyrite S	0.05
sulfidic - TSA equiv. S% pyrite	0.02	% pyrite S	< 0.02
Sulfur - KCl Extractable	0.02	% S	< 0.02
Sulfur - Peroxide	0.02	% S	< 0.02
Sulfur - Peroxide Oxidisable Sulfur	0.02	% S	< 0.02
acidity - Peroxide Oxidisable Sulfur	10	mol H+/t	< 10
HCl Extractable Sulfur	0.02	% S	< 0.02
Net Acid soluble sulfur	0.02	% S	< 0.02
Net Acid soluble sulfur - acidity units	10	mol H+/t	< 10
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	< 0.02
Calcium - KCl Extractable	0.02	% Ca	0.02
Calcium - Peroxide	0.02	% Ca	< 0.02
Acid Reacted Calcium	0.02	% Ca	< 0.02
acidity - Acid Reacted Calcium	10	mol H+/t	< 10
sulfidic - Acid Reacted Ca equiv. S% pyrite	0.02	% S	< 0.02
Magnesium - KCl Extractable	0.02	% Mg	0.04
Magnesium - Peroxide	0.02	% Mg	0.04
Acid Reacted Magnesium	0.02	% Mg	< 0.02
acidity - Acid Reacted Magnesium	10	mol H+/t	< 10
sulfidic - Acid Reacted Mg equiv. S% pyrite	0.02	% S	< 0.02
Acid Neutralising Capacity (ANCE)	0.02	%CaCO3	n/a
Acid Neutralising Capacity - Acidity units (a-ANCE)	10	mol H+/t	n/a
Acid Neutralising Capacity - equivalent S% pyrite(s-ANCE)	0.02	% S	n/a
ANC Fineness Factor		factor	1.5
SPOCAS - Net Acidity (Sulfur Units)	0.02	% S	0.05
SPOCAS - Net Acidity (Acidity Units)	10	mol H+/t	32
SPOCAS - Liming rate	1	kg CaCO3/t	2.0

Client Sample ID			BH3_2.75-3.0
Sample Matrix			Soil
Eurofins mgt Sample No.			S18-Fe32467
Date Sampled			Feb 23, 2018
Test/Reference	LOR	Unit	
Extraneous Material			
<2mm Fraction	0.005	g	200
>2mm Fraction	0.005	g	0.54
Analysed Material	0.1	%	100
Extraneous Material	0.1	%	0.3
% Moisture	1	%	12

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 (regarding both quality and NATA accreditation).

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			
SPOCAS Suite	Brisbane	Mar 02, 2018	6 Week
- Method: LTM-GEN-7050			
Extraneous Material	Brisbane	Mar 02, 2018	6 Week
- Method: LTM-GEN-7050/7070			
% Moisture	Brisbane	Feb 28, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: ADDITIONAL - MANN ST GOSFORD
Project ID: SYDGE214942

Order No.:
Report #: 586943
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Feb 28, 2018 11:36 AM
Due: Mar 7, 2018
Priority: 5 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						SPOCAS Suite	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794						X	X
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	BH3 2.75-3.0	Feb 23, 2018		Soil	S18-Fe32467	X	X
Test Counts						1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota 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. 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 Sample Receipt Advice.

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	Quality Systems Manual ver 5.1 US Department of Defense
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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

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

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
SPOCAS Suite				Result 1	Result 2	RPD			
pH-KCL	B18-Ma01750	NCP	pH Units	9.1	9.1	<1	30%	Pass	
pH-OX	B18-Ma01750	NCP	pH Units	6.4	6.4	<1	30%	Pass	
Acid trail - Titratable Actual Acidity	B18-Ma01750	NCP	mol H+/t	< 2	< 2	<1	30%	Pass	
Acid trail - Titratable Peroxide Acidity	B18-Ma01750	NCP	mol H+/t	< 2	< 2	<1	30%	Pass	
Acid trail - Titratable Sulfidic Acidity	B18-Ma01750	NCP	mol H+/t	< 2	< 2	<1	30%	Pass	
sulfidic - TAA equiv. S% pyrite	B18-Ma01750	NCP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
sulfidic - TPA equiv. S% pyrite	B18-Ma01750	NCP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
sulfidic - TSA equiv. S% pyrite	B18-Ma01750	NCP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - KCl Extractable	B18-Ma01750	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - Peroxide	B18-Ma01750	NCP	% S	0.02	0.02	18	30%	Pass	
Sulfur - Peroxide Oxidisable Sulfur	B18-Ma01750	NCP	% S	0.02	0.02	18	30%	Pass	
acidity - Peroxide Oxidisable Sulfur	B18-Ma01750	NCP	mol H+/t	15	13	18	30%	Pass	
HCl Extractable Sulfur	B18-Ma01750	NCP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur	B18-Ma01750	NCP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - acidity units	B18-Ma01750	NCP	mol H+/t	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	B18-Ma01750	NCP	% S	n/a	n/a	n/a	30%	Pass	
Calcium - KCl Extractable	B18-Ma01750	NCP	% Ca	0.06	0.06	<1	30%	Pass	
Calcium - Peroxide	B18-Ma01750	NCP	% Ca	0.06	0.06	8.0	30%	Pass	
Acid Reacted Calcium	B18-Ma01750	NCP	% Ca	< 0.02	< 0.02	<1	30%	Pass	
acidity - Acid Reacted Calcium	B18-Ma01750	NCP	mol H+/t	< 10	< 10	<1	30%	Pass	
sulfidic - Acid Reacted Ca equiv. S% pyrite	B18-Ma01750	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Magnesium - KCl Extractable	B18-Ma01750	NCP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
Magnesium - Peroxide	B18-Ma01750	NCP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
Acid Reacted Magnesium	B18-Ma01750	NCP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
acidity - Acid Reacted Magnesium	B18-Ma01750	NCP	mol H+/t	< 10	< 10	<1	30%	Pass	
sulfidic - Acid Reacted Mg equiv. S% pyrite	B18-Ma01750	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Acid Neutralising Capacity (ANCE)	B18-Ma01750	NCP	%CaCO3	n/a	n/a	n/a	30%	Pass	
Acid Neutralising Capacity - Acidity units (a-ANCE)	B18-Ma01750	NCP	mol H+/t	n/a	n/a	n/a	30%	Pass	
ANC Fineness Factor	B18-Ma01750	NCP	factor	1.5	1.5	<1	30%	Pass	
SPOCAS - Liming rate	B18-Ma01750	NCP	kg CaCO3/t	< 1	< 1	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	B18-Fe05007	NCP	%	18	17	8.0	30%	Pass	

Comments

Sample Integrity

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

Comments

Qualifier Codes/Comments

Code	Description
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5

Authorised By

Nibha Vaidya	Analytical Services Manager
Jonathon Angell	Senior Analyst-Inorganic (QLD)
Myles Clark	Senior Analyst-Metal (QLD)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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environments SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE		Consigning Office: Chatswood		Report Results to: Simon Hay		Mobile: 0424 703 009		Email: simon.hay@coffey.com										
		Invoices to: Simon Hay		Phone: _____		Email: luke.steller@coffey.com												
Project No: SYDGE214942		Task No: _____		Analysis Request Section														
Project Name: Mann St Gosford		Laboratory: Eurofins		NOTES														
Sampler's Name: Lily		Project Manager: Simon Hay																
Special Instructions: See Notes																		
Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	Suite B4 (TRH, BTEX, PAH)	Suite M8 (Metals)	Suite B13 (OCP, PCB)	pH Fieldscreen (pH & pHfox)	SPOCAS	TRH (C6-C10) & BTEX	Asbestos	Hold				
	BH3_0.6-1.0	#####		Soil	Jar		X	X	X				X					
	BH3_1.9-2.0	#####		Soil	Jar		X	X		X								
	BH3_2.45-2.70	#####		Soil	Jar					X								
	BH3_2.75-3.0	#####		Soil	Jar					X								
	TS2	#####			Vial							X						
	T82	#####			Vial							X						
Samples to be analysed on a 5 day TAT for Suites B4, M8, B13, asbestos and TRH C6-C10 + BTEX. Please conduct pH field Screen on 1 day TAT only																		
RELINQUISHED BY						RECEIVED BY						Sample Receipt Advice: (Lab Use Only)						
Name: Lily Parchizadeh		Date: 23/02/2018		Name:		Date: 26/2		All Samples Received in Good Condition ☐ All Documentation is in Proper Order ☐ Samples Received Properly Chilled ☐ Lab. Ref/Batch No. 586384										
Coffey Environments		Time: _____		Company: _____		Time: _____												
Name: _____		Date: _____		Name: _____		Date: _____												
Company: _____		Time: _____		Company: _____		Time: _____												
*Container Type & Preservation Codes: P - Plastic, G - Glass Bottle, J - Glass Jar, V - Vial, Z - Ziplock bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative																		

Enviro Sample NSW

From: Hay, Simon <Simon.Hay@coffey.com>
Sent: Monday, 26 February 2018 2:09 PM
To: Enviro Sample NSW
Cc: Steller, Luke; Nibha Vaidya
Subject: sample scheduling
Attachments: 586384_sample_receipt_coc.pdf; 586384_summary.pdf; 23022017 Chain of Custody Form Electronic.xlsx

Follow Up Flag: Follow up
Flag Status: Flagged

Hi there,

Can I schedule analysis of these samples as per the attached COC. Can you please conduct pH field screen on 1 day TAT – all other analytes to be analysed on standard TAT.

Thanks very much and Kind Regards,

Simon Hay
Environmental Scientist

Level 20, Tower B - Citadel Tower
799 Pacific Highway Chatswood NSW 2067

t: +61 2 9406 1060
f: +61 2 9406 1002
m: 0424 703 009
w: coffey.com



>>> Ingenuity@coffey – it's the ideas that count



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ScannedByWebsenseForEurofins

Sample Receipt Advice

Company name: **Coffey Environments Pty Ltd NSW**

Contact name: Luke Steller
Project name: MANN ST GOSFORD
Project ID: SYDGE214942
COC number: Not provided
Turn around time: 5 Day
Date/Time received: Feb 26, 2018 2:09 PM
Eurofins | mgt reference: **586384**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 21.4 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Luke Steller - Luke.Steller@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Environments Pty Ltd NSW email address.

Certificate of Analysis



Accredited for compliance with ISO/IEC 17025-Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Coffey Environments Pty Ltd NSW
Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Attention: Luke Steller
Report 586384-AID
Project Name MANN ST GOSFORD
Project ID SYDGE214942
Received Date Feb 23, 2018
Date Reported Mar 05, 2018

Methodology:

Asbestos Fibre
 Identification

Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques.

NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.

Unknown Mineral
 Fibres

Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity.

NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.

Subsampling Soil
 Samples

The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed.

NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.

Bonded asbestos-
 containing material
 (ACM)

The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination. The resultant material is then further examined in accordance with AS 4964 - 2004.

NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.

Limit of Reporting

The performance limitation of the AS4964 method for inhomogeneous samples is around 0.1 g/kg (0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis where required, this is considered to be at the nominal reporting limit of 0.01 % (w / w). The examination of large sample sizes (500 mL is recommended) may improve the likelihood of identifying ACM in the > 2mm fraction. The NEPM screening level of 0.001 % (w / w) asbestos in soil for FA (friable asbestos) and AF (asbestos fines) then applies where they are able to be quantified by gravimetric procedures. This quantitative screening is not generally applicable to FF (free fibres) and results of Trace Analysis are referred.

NOTE: NATA News March 2014, p.7, states in relation to AS4964: "This is a qualitative method with a nominal reporting limit of 0.01%" and that currently in Australia "there is no validated method available for the quantification of asbestos". Accordingly, NATA Accreditation does not cover the performance of this service (indicated with an asterisk). This report is consistent with the analytical procedures and reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended) and the Western Australia Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia, 2009, including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil, June 2011.

Project Name MANN ST GOSFORD
Project ID SYDGE214942
Date Sampled Feb 23, 2018
Report 586384-AID

Client Sample ID	Eurofins mgt Sample No.	Date Sampled	Sample Description	Result
BH3_0.6-1.0	18-Fe29237	Feb 23, 2018	Approximate Sample 68g Sample consisted of: Brown fine grain soil	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.

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 (regarding both quality and NATA accreditation).

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
Asbestos - LTM-ASB-8020	Sydney	Feb 26, 2018	Indefinite

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: MANN ST GOSFORD
Project ID: SYDGE214942

Order No.:
Report #: 586384
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Feb 26, 2018 2:09 PM
Due: Mar 5, 2018
Priority: 5 Day
Contact Name: Luke Steller

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	TRH C6-C9	Metals M8	BTEX	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID							
1	BH3 0.6-1.0	Feb 23, 2018		Soil	S18-Fe29237	X		X		X	X	X
2	BH3 1.9-2.0	Feb 23, 2018		Soil	S18-Fe29238			X			X	X
3	SOIL TRIP BLANK	Feb 23, 2018		Soil	S18-Fe29241		X		X			
4	SOIL TRIP SPIKE	Feb 23, 2018		Soil	S18-Fe29242		X		X			
Test Counts						1	2	2	2	1	2	2

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. 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 Sample Receipt Advice.

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.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Western Australia Department of Health
NOHSC	National Occupational Health and Safety Commission
ACM	Bonded asbestos-containing material means any material containing more than 1% asbestos and comprises asbestos-containing-material which is in sound condition, although possibly broken or fragmented, and where the asbestos is bound in a matrix such as cement or resin. Common examples of ACM include but are not limited to: pipe and boiler insulation, sprayed-on fireproofing, troweled-on acoustical plaster, floor tile and mastic, floor linoleum, transite shingles, roofing materials, wall and ceiling plaster, ceiling tiles, and gasket materials. This term is restricted to material that cannot pass a 7 mm x 7 mm sieve. This sieve size is selected because it approximates the thickness of common asbestos cement sheeting and for fragments to be smaller than this would imply a high degree of damage and hence potential for fibre release.
FA	FA comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. This material is typically unbonded or was previously bonded and is now significantly degraded (crumbling).
PACM	Presumed Asbestos-Containing Material means thermal system insulation and surfacing material found in buildings, vessels, and vessel sections constructed no later than 1980 that are assumed to contain greater than one percent asbestos but have not been sampled or analyzed to verify or negate the presence of asbestos.
AF	Asbestos fines (AF) are defined as free fibres, or fibre bundles, smaller than 7mm. It is the free fibres which present the greatest risk to human health, although very small fibres (< 5 microns in length) are not considered to be such a risk. AF also includes small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve. (Note that for bonded ACM fragments to pass through a 7 mm x 7 mm sieve implies a substantial degree of damage which increases the potential for fibre release.)
AC	Asbestos cement means a mixture of cement and asbestos fibres (typically 90:10 ratios).

Comments

The sample received was not collected in an approved asbestos bag and was therefore sub-sampled from the 250mL glass jar. Valid sub-sampling procedures were applied so as to ensure that the sub-sample to be analysed accurately represented the sample received.

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

Comments

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Sayed Abu Senior Analyst-Asbestos (NSW)

Authorised by:

Matthew Quigley Senior Analyst-Asbestos (NSW)



Glenn Jackson
National Operations Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

Uncertainty data is available on request

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Certificate of Analysis

Coffey Environments Pty Ltd NSW
Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Luke Steller

Report 586384-S
Project name MANN ST GOSFORD
Project ID SYDGE214942
Received Date Feb 23, 2018

Client Sample ID			BH3_0.6-1.0 Soil	BH3_1.9-2.0 Soil	SOIL TRIP BLANK Soil	R20 SOIL TRIP SPIKE Soil
Sample Matrix			S18-Fe29237	S18-Fe29238	S18-Fe29241	S18-Fe29242
Eurofins mgt Sample No.			Feb 23, 2018	Feb 23, 2018	Feb 23, 2018	Feb 23, 2018
Date Sampled						
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	100
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 C10-36 (Total)	50	mg/kg	< 50	< 50	-	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	110
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	100
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	100
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	100
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	100
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	100
4-Bromofluorobenzene (surr.)	1	%	92	63	130	81
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	-	-
TRH C6-C10	20	mg/kg	< 20	< 20	-	-
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	-	-
TRH >C10-C16	50	mg/kg	< 50	< 50	-	-
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	-	-
TRH >C16-C34	100	mg/kg	< 100	< 100	-	-
TRH >C34-C40	100	mg/kg	< 100	< 100	-	-
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	-	-

Client Sample ID			BH3_0.6-1.0 Soil	BH3_1.9-2.0 Soil	SOIL TRIP BLANK Soil	R20 SOIL TRIP SPIKE Soil
Sample Matrix			S18-Fe29237	S18-Fe29238	S18-Fe29241	S18-Fe29242
Eurofins mgt Sample No.			Feb 23, 2018	Feb 23, 2018	Feb 23, 2018	Feb 23, 2018
Date Sampled						
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
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	%	88	81	-	-
p-Terphenyl-d14 (surr.)	1	%	117	116	-	-
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	0.2	mg/kg	< 0.2	-	-	-
Toxaphene	1	mg/kg	< 1	-	-	-
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	%	121	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	120	-	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	-	-
Total PCB*	0.5	mg/kg	< 0.5	-	-	-
Dibutylchlorendate (surr.)	1	%	121	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	120	-	-	-

Client Sample ID			BH3_0.6-1.0	BH3_1.9-2.0	SOIL TRIP	R20 SOIL TRIP
Sample Matrix			Soil	Soil	BLANK	SPIKE
Eurofins mgt Sample No.			S18-Fe29237	S18-Fe29238	S18-Fe29241	S18-Fe29242
Date Sampled			Feb 23, 2018	Feb 23, 2018	Feb 23, 2018	Feb 23, 2018
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	2.4	< 2	-	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	-	-
Chromium	5	mg/kg	5.9	6.5	-	-
Copper	5	mg/kg	< 5	< 5	-	-
Lead	5	mg/kg	30	7.1	-	-
Mercury	0.1	mg/kg	0.2	< 0.1	-	-
Nickel	5	mg/kg	< 5	< 5	-	-
Zinc	5	mg/kg	11	< 5	-	-
% Moisture	1	%	22	9.8	-	-

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 (regarding both quality and NATA accreditation).

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 mgt Suite B4			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Feb 28, 2018	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Feb 28, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Feb 28, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Feb 28, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Sydney	Feb 28, 2018	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soils by GCMS			
Organochlorine Pesticides	Sydney	Feb 28, 2018	14 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Sydney	Feb 28, 2018	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Metals M8	Sydney	Feb 28, 2018	28 Day
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	Feb 26, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: MANN ST GOSFORD
Project ID: SYDGE214942

Order No.:
Report #: 586384
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Feb 26, 2018 2:09 PM
Due: Mar 5, 2018
Priority: 5 Day
Contact Name: Luke Steller

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - AS4964	TRH C6-C9	Metals M8	BTEX	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID							
1	BH3 0.6-1.0	Feb 23, 2018		Soil	S18-Fe29237	X		X		X	X	X
2	BH3 1.9-2.0	Feb 23, 2018		Soil	S18-Fe29238			X			X	X
3	SOIL TRIP BLANK	Feb 23, 2018		Soil	S18-Fe29241		X		X			
4	SOIL TRIP SPIKE	Feb 23, 2018		Soil	S18-Fe29242		X		X			
Test Counts						1	2	2	2	1	2	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota 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. 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 Sample Receipt Advice.

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	Quality Systems Manual ver 5.1 US Department of Defense
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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. 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	
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							
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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	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	%	94			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	94			70-130	Pass	
Toluene	%	106			70-130	Pass	
Ethylbenzene	%	91			70-130	Pass	
m&p-Xylenes	%	106			70-130	Pass	
o-Xylene	%	104			70-130	Pass	
Xylenes - Total	%	105			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	129			70-130	Pass	
TRH C6-C10	%	91			70-130	Pass	
TRH >C10-C16	%	102			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	108			70-130	Pass	
Acenaphthylene	%	107			70-130	Pass	
Anthracene	%	111			70-130	Pass	
Benz(a)anthracene	%	107			70-130	Pass	
Benzo(a)pyrene	%	111			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(b&j)fluoranthene			%	117			70-130	Pass	
Benzo(g.h.i)perylene			%	92			70-130	Pass	
Benzo(k)fluoranthene			%	113			70-130	Pass	
Chrysene			%	107			70-130	Pass	
Dibenz(a.h)anthracene			%	95			70-130	Pass	
Fluoranthene			%	95			70-130	Pass	
Fluorene			%	109			70-130	Pass	
Indeno(1.2.3-cd)pyrene			%	103			70-130	Pass	
Naphthalene			%	99			70-130	Pass	
Phenanthrene			%	110			70-130	Pass	
Pyrene			%	93			70-130	Pass	
LCS - % Recovery									
Organochlorine Pesticides									
4,4'-DDD			%	88			70-130	Pass	
4,4'-DDE			%	96			70-130	Pass	
4,4'-DDT			%	112			70-130	Pass	
a-BHC			%	104			70-130	Pass	
Aldrin			%	104			70-130	Pass	
b-BHC			%	96			70-130	Pass	
d-BHC			%	96			70-130	Pass	
Dieldrin			%	104			70-130	Pass	
Endosulfan I			%	96			70-130	Pass	
Endosulfan II			%	88			70-130	Pass	
Endosulfan sulphate			%	104			70-130	Pass	
Endrin			%	104			70-130	Pass	
Endrin aldehyde			%	96			70-130	Pass	
Endrin ketone			%	96			70-130	Pass	
g-BHC (Lindane)			%	104			70-130	Pass	
Heptachlor			%	112			70-130	Pass	
Heptachlor epoxide			%	104			70-130	Pass	
Hexachlorobenzene			%	96			70-130	Pass	
Methoxychlor			%	104			70-130	Pass	
LCS - % Recovery									
Polychlorinated Biphenyls									
Aroclor-1260			%	91			70-130	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic			%	107			70-130	Pass	
Cadmium			%	107			70-130	Pass	
Chromium			%	109			70-130	Pass	
Copper			%	109			70-130	Pass	
Lead			%	114			70-130	Pass	
Mercury			%	114			70-130	Pass	
Nickel			%	111			70-130	Pass	
Zinc			%	111			70-130	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	S18-Ma00612	NCP	%	78			70-130	Pass	
TRH C10-C14	S18-Fe33785	NCP	%	92			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S18-Ma00612	NCP	%	80			70-130	Pass	
Toluene	S18-Ma00612	NCP	%	89			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Ethylbenzene	S18-Ma00612	NCP	%	73			70-130	Pass	
m&p-Xylenes	S18-Ma00612	NCP	%	90			70-130	Pass	
o-Xylene	S18-Ma00612	NCP	%	87			70-130	Pass	
Xylenes - Total	S18-Ma00612	NCP	%	89			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S18-Ma00612	NCP	%	100			70-130	Pass	
TRH C6-C10	S18-Ma00612	NCP	%	75			70-130	Pass	
TRH >C10-C16	S18-Fe33785	NCP	%	97			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S18-Fe31772	NCP	%	112			70-130	Pass	
Acenaphthylene	S18-Fe31772	NCP	%	111			70-130	Pass	
Anthracene	S18-Fe31772	NCP	%	108			70-130	Pass	
Benz(a)anthracene	S18-Fe31772	NCP	%	109			70-130	Pass	
Benzo(a)pyrene	S18-Fe31772	NCP	%	114			70-130	Pass	
Benzo(b&j)fluoranthene	S18-Fe31772	NCP	%	118			70-130	Pass	
Benzo(g,h,i)perylene	S18-Fe31772	NCP	%	104			70-130	Pass	
Benzo(k)fluoranthene	S18-Fe31772	NCP	%	114			70-130	Pass	
Chrysene	S18-Fe31772	NCP	%	111			70-130	Pass	
Dibenz(a,h)anthracene	S18-Fe31772	NCP	%	105			70-130	Pass	
Fluoranthene	S18-Fe31772	NCP	%	98			70-130	Pass	
Fluorene	S18-Fe31772	NCP	%	108			70-130	Pass	
Indeno(1,2,3-cd)pyrene	S18-Fe31772	NCP	%	113			70-130	Pass	
Naphthalene	S18-Fe31772	NCP	%	98			70-130	Pass	
Phenanthrene	S18-Fe31772	NCP	%	104			70-130	Pass	
Pyrene	S18-Fe31772	NCP	%	96			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4,4'-DDD	S18-Fe32585	NCP	%	104			70-130	Pass	
4,4'-DDE	S18-Fe32585	NCP	%	104			70-130	Pass	
a-BHC	S18-Fe32585	NCP	%	96			70-130	Pass	
Aldrin	S18-Fe32585	NCP	%	104			70-130	Pass	
b-BHC	S18-Fe32585	NCP	%	96			70-130	Pass	
d-BHC	S18-Fe32585	NCP	%	96			70-130	Pass	
Dieldrin	S18-Fe32585	NCP	%	120			70-130	Pass	
Endosulfan I	S18-Fe32585	NCP	%	96			70-130	Pass	
Endosulfan II	S18-Fe32585	NCP	%	88			70-130	Pass	
Endosulfan sulphate	S18-Fe32585	NCP	%	88			70-130	Pass	
Endrin	S18-Fe32585	NCP	%	96			70-130	Pass	
Endrin aldehyde	S18-Fe32585	NCP	%	88			70-130	Pass	
Endrin ketone	S18-Fe32585	NCP	%	104			70-130	Pass	
g-BHC (Lindane)	S18-Fe32585	NCP	%	88			70-130	Pass	
Heptachlor	S18-Fe32585	NCP	%	104			70-130	Pass	
Heptachlor epoxide	S18-Fe26440	NCP	%	112			70-130	Pass	
Hexachlorobenzene	S18-Fe32585	NCP	%	104			70-130	Pass	
Methoxychlor	S18-Fe26440	NCP	%	72			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	S18-Fe32585	NCP	%	89			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S18-Fe31772	NCP	%	105			70-130	Pass	
Cadmium	S18-Fe31772	NCP	%	108			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Chromium	S18-Fe31772	NCP	%	102			70-130	Pass	
Copper	S18-Fe31772	NCP	%	101			70-130	Pass	
Lead	S18-Fe31772	NCP	%	121			70-130	Pass	
Mercury	S18-Fe31772	NCP	%	113			70-130	Pass	
Nickel	S18-Fe31772	NCP	%	101			70-130	Pass	
Zinc	S18-Fe31772	NCP	%	111			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	S18-Ma00315	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S18-Fe31769	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S18-Fe31769	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S18-Fe31769	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S18-Ma00315	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S18-Ma00315	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S18-Ma00315	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S18-Ma00315	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S18-Ma00315	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S18-Ma00315	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S18-Ma00315	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S18-Ma00315	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S18-Fe31769	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S18-Fe31769	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S18-Fe31769	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S18-Fe31769	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S18-Fe31769	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S18-Fe31769	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S18-Fe31769	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S18-Fe31769	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S18-Fe31769	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g,h,i)perylene	S18-Fe31769	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S18-Fe31769	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S18-Fe31769	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a,h)anthracene	S18-Fe31769	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S18-Fe31769	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S18-Fe31769	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1,2,3-cd)pyrene	S18-Fe31769	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S18-Fe31769	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S18-Fe31769	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S18-Fe31769	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S18-Fe30154	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4,4'-DDD	S18-Fe30154	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4,4'-DDE	S18-Fe30154	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4,4'-DDT	S18-Fe30154	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S18-Fe30154	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S18-Fe30154	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate								
Organochlorine Pesticides				Result 1	Result 2	RPD		
b-BHC	S18-Fe30154	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
d-BHC	S18-Fe30154	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Dieldrin	S18-Fe30154	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan I	S18-Fe30154	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan II	S18-Fe30154	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan sulphate	S18-Fe30154	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin	S18-Fe30154	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin aldehyde	S18-Fe30154	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin ketone	S18-Fe30154	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
g-BHC (Lindane)	S18-Fe30154	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor	S18-Fe30154	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor epoxide	S18-Fe30154	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Hexachlorobenzene	S18-Fe30154	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Methoxychlor	S18-Fe30154	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Toxaphene	S18-Fe30154	NCP	mg/kg	< 1	< 1	<1	30%	Pass
Duplicate								
Polychlorinated Biphenyls				Result 1	Result 2	RPD		
Aroclor-1016	S18-Fe30154	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1221	S18-Fe30154	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1232	S18-Fe30154	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1242	S18-Fe30154	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1248	S18-Fe30154	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1254	S18-Fe30154	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1260	S18-Fe30154	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	S18-Ma01027	NCP	mg/kg	2.7	2.7	<1	30%	Pass
Cadmium	S18-Ma01027	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	S18-Fe31769	NCP	mg/kg	< 5	< 5	<1	30%	Pass
Copper	S18-Fe31769	NCP	mg/kg	< 5	< 5	<1	30%	Pass
Lead	S18-Fe31769	NCP	mg/kg	< 5	< 5	<1	30%	Pass
Mercury	S18-Ma01027	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Nickel	S18-Fe31769	NCP	mg/kg	< 5	< 5	<1	30%	Pass
Zinc	S18-Fe31769	NCP	mg/kg	< 5	< 5	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	S18-Fe29238	CP	%	9.8	9.4	3.0	30%	Pass

Comments

Sample Integrity

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

Comments

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
R20	This sample is a Trip Spike and therefore all results are reported as a percentage

Authorised By

Nibha Vaidya	Analytical Services Manager
Nibha Vaidya	Senior Analyst-Asbestos (NSW)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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coffey  environments SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE		Consigning Office: Chatswood		Report Results to: Simon Hay		Mobile: 0424 703 009		Email: simon.hay@coffey.com												
		Invoices to: Simon Hay		Phone: 0427 643 063		Email: luke.steller@coffey.com														
Project No: SYDGE214942 Task No:				Analysis Request Section																
Project Name: Mann St Gosford Laboratory: Eurofins				NOTES																
Sampler's Name: Lily Project Manager: Simon Hay																				
Special Instructions																				
Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	Suite B4 (TRH, BTEX, PAH)	Suite M8 (Metals)	Suite B13 OCP, PCB	pH Fieldscreen pH, pHfox	SPOCAS	TRH (C6-C10) & BTEX	Asbestos NEPM/WA (500 mL)	Hold						
	S1	270218		Soil		5 day							X							
	S2	270218		Soil		5 day							X							
	S3	270218		Soil		5 day							X							
	S4	270218		Soil		5 day							X							
	S5	270218		Soil		5 day							X							
	R1	270218		Water		5 day	X	X	X											
	BH4_0.0-0.3	270218		Soil		5 day	X	X	X											
	BH4_1.8-0.2	270218		Soil		5 day	X	X		X										Can you please undertake pH field testing on 1 day TAT
	BH4_2.5-2.7	270218		Soil		5 day				X										
	TS3											X								
	TB3											X								
RELINQUISHED BY				RECEIVED BY				Sample Receipt Advice: (Lab Use Only)												
Name: Luke Steller		Date: 27/02/2018		Name: Simon Hay		Date: 28/2		All Samples Received in Good Condition ☒												
Coffey Environments		Time:		Company: Eurofins Mof		Time: 12:30pm		All Documentation is in Proper Order ☒												
Name:		Date:		Name:		Date:		Samples Received Properly Chilled ☒												
Company:		Time:		Company:		Time:		Lab. Ref/Batch No. 586958												
*Container Type & Preservation Codes: P - Plastic, G - Glass Bottle, J - Glass Jar, V - Vial, Z - Ziplock bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative																				

Sample Receipt Advice

Company name: **Coffey Environments Pty Ltd NSW**

Contact name: **Simon Hay**

Project name: **MANN ST GOSFORD**

Project ID: **SYDGE214942**

COC number: **Not provided**

Turn around time: **1 Day**

Date/Time received: **Feb 28, 2018 12:50 PM**

Eurofins | mgt reference: **586955**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 1.5 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Simon Hay - simon.hay@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Environments Pty Ltd NSW email address.

Certificate of Analysis

Coffey Environments Pty Ltd NSW
Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: **Simon Hay**

Report **586955-S**
 Project name MANN ST GOSFORD
 Project ID SYDGE214942
 Received Date Feb 28, 2018

Client Sample ID			BH4_1.8-0.2	BH4_2.5-2.7
Sample Matrix			Soil	Soil
Eurofins mgt Sample No.			S18-Fe32512	S18-Fe32513
Date Sampled			Feb 27, 2018	Feb 27, 2018
Test/Reference	LOR	Unit		
Acid Sulfate Soils Field pH Test				
pH-F (Field pH test)*	0.1	pH Units	6.6	6.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.2	4.1
Reaction Ratings* ^{S05}		comment	4.0	4.0

Sample History

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

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

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

Acid Sulfate Soils Field pH Test

Testing Site

Sydney

Extracted

Feb 28, 2018

Holding Time

7 Days

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

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: MANN ST GOSFORD
Project ID: SYDGE214942

Order No.:
Report #: 586955
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Feb 28, 2018 12:50 PM
Due: Mar 1, 2018
Priority: 1 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Acid Sulfate Soils Field pH Test
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						X
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						
External Laboratory						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID	
1	BH4 1.8-0.2	Feb 27, 2018		Soil	S18-Fe32512	X
2	BH4 2.5-2.7	Feb 27, 2018		Soil	S18-Fe32513	X
Test Counts						2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota 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. 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 Sample Receipt Advice.

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.

****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	Quality Systems Manual ver 5.1 US Department of Defense
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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. 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.

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

Comments

Qualifier Codes/Comments

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

Authorised By

Nibha Vaidya Analytical Services Manager



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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Enviro Sample NSW

From: Nibha Vaidya
Sent: Friday, 2 March 2018 11:56 AM
To: Enviro Sample NSW; COC NSW
Subject: FW: Eurofins | mgt Test Results - Report 586955 : Site MANN ST GOSFORD (SYDGE214942)

Follow Up Flag: Follow up
Flag Status: Flagged

Additional SPOCAS please

Kind Regards,

Nibha Vaidya
Phone : +61 2 9900 8415
Mobile : +61 499 900 805
Email : NibhaVaidya@eurofins.com

From: Hay, Simon [<mailto:Simon.Hay@coffey.com>]
Sent: Friday, 2 March 2018 7:39 AM
To: Asim Khan
Cc: Nibha Vaidya
Subject: RE: Eurofins | mgt Test Results - Report 586955 : Site MANN ST GOSFORD (SYDGE214942)

EXTERNAL EMAIL*

Hi Asim, how are you?

Could I please schedule in sample BH3_2.5-2.7 for SPOCAS testing please?

Thanks and kind regards

Simon

From: AsimKhan@eurofins.com [<mailto:AsimKhan@eurofins.com>]
Sent: Thursday, March 1, 2018 6:47 PM
To: Hay, Simon <Simon.Hay@coffey.com>
Cc: Steller, Luke <Luke.Steller@coffey.com>
Subject: Eurofins | mgt Test Results - Report 586955 : Site MANN ST GOSFORD (SYDGE214942)

Dear Simon,

Please find attached results for your project in the subject header.

Kind regards,

Asim Khan
Analytical Services Manager

Eurofins | mgt

Unit F3, Parkview Building

16 Mars Road

LANE COVE WEST NSW 2066

AUSTRALIA

Phone : +61 2 9900 8432

Email : AsimKhan@eurofins.com

Website : www.eurofins.com.au/environmental-testing

[EnviroNote 1074 - Passive Samplers for VOCs in Air](#)

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Sample Receipt Advice

Company name: **Coffey Environments Pty Ltd NSW**
Contact name: Simon Hay
Project name: ADDITIONAL - MANN ST GOSFORD
Project ID: SYDGE214942
COC number: Not provided
Turn around time: 5 Day
Date/Time received: Mar 2, 2018 11:56 AM
Eurofins | mgt reference: **587403**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 1.5 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Simon Hay - simon.hay@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Environments Pty Ltd NSW email address.

Certificate of Analysis

Coffey Environments Pty Ltd NSW
Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Simon Hay

Report 587403-S
Project name ADDITIONAL - MANN ST GOSFORD
Project ID SYDGE214942
Received Date Mar 02, 2018

Client Sample ID			BH4_2.5-2.7
Sample Matrix			Soil
Eurofins mgt Sample No.			S18-Ma02695
Date Sampled			Feb 27, 2018
Test/Reference	LOR	Unit	
SPOCAS Suite			
pH-KCL	0.1	pH Units	4.6
pH-OX	0.1	pH Units	4.2
Acid trail - Titratable Actual Acidity	2	mol H+/t	22
Acid trail - Titratable Peroxide Acidity	2	mol H+/t	41
Acid trail - Titratable Sulfidic Acidity	2	mol H+/t	19
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.04
sulfidic - TPA equiv. S% pyrite	0.02	% pyrite S	0.07
sulfidic - TSA equiv. S% pyrite	0.02	% pyrite S	0.03
Sulfur - KCl Extractable	0.02	% S	< 0.02
Sulfur - Peroxide	0.02	% S	< 0.02
Sulfur - Peroxide Oxidisable Sulfur	0.02	% S	< 0.02
acidity - Peroxide Oxidisable Sulfur	10	mol H+/t	< 10
HCl Extractable Sulfur	0.02	% S	n/a
Net Acid soluble sulfur	0.02	% S	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a
Calcium - KCl Extractable	0.02	% Ca	< 0.02
Calcium - Peroxide	0.02	% Ca	< 0.02
Acid Reacted Calcium	0.02	% Ca	< 0.02
acidity - Acid Reacted Calcium	10	mol H+/t	< 10
sulfidic - Acid Reacted Ca equiv. S% pyrite	0.02	% S	< 0.02
Magnesium - KCl Extractable	0.02	% Mg	< 0.02
Magnesium - Peroxide	0.02	% Mg	< 0.02
Acid Reacted Magnesium	0.02	% Mg	< 0.02
acidity - Acid Reacted Magnesium	10	mol H+/t	< 10
sulfidic - Acid Reacted Mg equiv. S% pyrite	0.02	% S	< 0.02
Acid Neutralising Capacity (ANCE)	0.02	%CaCO3	n/a
Acid Neutralising Capacity - Acidity units (a-ANCE)	10	mol H+/t	n/a
Acid Neutralising Capacity - equivalent S% pyrite(s-ANCE)	0.02	% S	n/a
ANC Fineness Factor		factor	1.5
SPOCAS - Net Acidity (Sulfur Units)	0.02	% S	0.04
SPOCAS - Net Acidity (Acidity Units)	10	mol H+/t	22
SPOCAS - Liming rate	1	kg CaCO3/t	2.0

Client Sample ID			BH4_2.5-2.7
Sample Matrix			Soil
Eurofins mgt Sample No.			S18-Ma02695
Date Sampled			Feb 27, 2018
Test/Reference	LOR	Unit	
Extraneous Material			
<2mm Fraction	0.005	g	170
>2mm Fraction	0.005	g	0.23
Analysed Material	0.1	%	100
Extraneous Material	0.1	%	0.1
% Moisture	1	%	17

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 (regarding both quality and NATA accreditation).

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			
SPOCAS Suite	Brisbane	Mar 06, 2018	6 Week
- Method: LTM-GEN-7050			
Extraneous Material	Brisbane	Mar 06, 2018	6 Week
- Method: LTM-GEN-7050/7070			
% Moisture	Brisbane	Mar 02, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: ADDITIONAL - MANN ST GOSFORD
Project ID: SYDGE214942

Order No.:
Report #: 587403
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Mar 2, 2018 11:56 AM
Due: Mar 9, 2018
Priority: 5 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						SPOCAS Suite	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794						X	X
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	BH4 2.5-2.7	Feb 27, 2018		Soil	S18-Ma02695	X	X
Test Counts						1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota 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. 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	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NC	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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

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

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
SPOCAS Suite				Result 1	Result 2	RPD			
pH-KCL	S18-Ma06237	NCP	pH Units	8.7	8.7	<1	30%	Pass	
pH-OX	S18-Ma06237	NCP	pH Units	7.9	7.9	<1	30%	Pass	
Acid trail - Titratable Actual Acidity	S18-Ma06237	NCP	mol H+/t	< 2	< 2	<1	30%	Pass	
Acid trail - Titratable Peroxide Acidity	S18-Ma06237	NCP	mol H+/t	< 2	< 2	<1	30%	Pass	
Acid trail - Titratable Sulfidic Acidity	S18-Ma06237	NCP	mol H+/t	< 2	< 2	<1	30%	Pass	
sulfidic - TAA equiv. S% pyrite	S18-Ma06237	NCP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
sulfidic - TPA equiv. S% pyrite	S18-Ma06237	NCP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
sulfidic - TSA equiv. S% pyrite	S18-Ma06237	NCP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - KCl Extractable	S18-Ma06237	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - Peroxide	S18-Ma06237	NCP	% S	0.03	0.02	8.0	30%	Pass	
Sulfur - Peroxide Oxidisable Sulfur	S18-Ma06237	NCP	% S	0.03	0.02	8.0	30%	Pass	
acidity - Peroxide Oxidisable Sulfur	S18-Ma06237	NCP	mol H+/t	16	15	8.0	30%	Pass	
HCl Extractable Sulfur	S18-Ma06237	NCP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur	S18-Ma06237	NCP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - acidity units	S18-Ma06237	NCP	mol H+/t	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	S18-Ma06237	NCP	% S	n/a	n/a	n/a	30%	Pass	
Calcium - KCl Extractable	S18-Ma06237	NCP	% Ca	0.28	0.27	1.0	30%	Pass	
Calcium - Peroxide	S18-Ma06237	NCP	% Ca	0.41	0.41	1.0	30%	Pass	
Acid Reacted Calcium	S18-Ma06237	NCP	% Ca	0.13	0.13	2.0	30%	Pass	
acidity - Acid Reacted Calcium	S18-Ma06237	NCP	mol H+/t	67	66	2.0	30%	Pass	
sulfidic - Acid Reacted Ca equiv. S% pyrite	S18-Ma06237	NCP	% S	0.11	0.11	2.0	30%	Pass	
Magnesium - KCl Extractable	S18-Ma06237	NCP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
Magnesium - Peroxide	S18-Ma06237	NCP	% Mg	0.03	0.03	2.0	30%	Pass	
Acid Reacted Magnesium	S18-Ma06237	NCP	% Mg	0.03	0.03	2.0	30%	Pass	
acidity - Acid Reacted Magnesium	S18-Ma06237	NCP	mol H+/t	27	26	2.0	30%	Pass	
sulfidic - Acid Reacted Mg equiv. S% pyrite	S18-Ma06237	NCP	% S	0.04	0.04	2.0	30%	Pass	
Acid Neutralising Capacity (ANCE)	S18-Ma06237	NCP	%CaCO3	0.58	0.57	2.0	30%	Pass	
Acid Neutralising Capacity - Acidity units (a-ANCE)	S18-Ma06237	NCP	mol H+/t	120	110	2.0	30%	Pass	
ANC Fineness Factor	S18-Ma06237	NCP	factor	1.5	1.5	<1	30%	Pass	
SPOCAS - Liming rate	S18-Ma06237	NCP	kg CaCO3/t	< 1	< 1	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S18-Ma02695	CP	%	17	16	7.0	30%	Pass	

Comments

Sample Integrity

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

Comments

Qualifier Codes/Comments

Code	Description
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5

Authorised By

Nibha Vaidya	Analytical Services Manager
Myles Clark	Senior Analyst-Metal (QLD)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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[illegible]

Enviro Sample NSW

From: Hay, Simon <Simon.Hay@coffey.com>
Sent: Thursday, 1 March 2018 7:52 AM
To: Enviro Sample NSW
Cc: lily.khouw@coffey.com; Steller, Luke
Subject: RE: Eurofins | mgt Sample Receipt Advice - Report 586989 : Site MANN ST GOSFORD (SYDGE214942)

Follow Up Flag: Follow up
Flag Status: Flagged

Hi There, can you please re-label the sample denoted as R1 on the coc as R2 to correspond with the rinsate sample received at the lab?

Thanks very much

From: EnviroSampleNSW@eurofins.com [<mailto:EnviroSampleNSW@eurofins.com>]
Sent: Thursday, March 1, 2018 12:21 AM
To: Hay, Simon <Simon.Hay@coffey.com>
Cc: lily.khouw@coffey.com; Steller, Luke <Luke.Steller@coffey.com>
Subject: Eurofins | mgt Sample Receipt Advice - Report 586989 : Site MANN ST GOSFORD (SYDGE214942)

Dear Valued Client,

R2: 2 vials, 1 250mL amber, 50mL FFmetal bottles received instead of R1; extra BH4_0.3-0.6: acid sulphate bag received placed on hold; Broken vial TS3 received analysis cancelled.

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 | mgt Analytical Services Manager as soon as possible to make certain that they get changed.

Regards

Jordan Yin

Sample Receipt

Eurofins | Mgt
Unit F3, Parkview Building
16 Mars Rd
LANE COVE WEST NSW 2066
AUSTRALIA
Phone: +61 29900 8492
Email: EnviroSampleNSW@eurofins.com
Website: environment.eurofins.com.au

[EnviroNote 1074 - Passive Samplers for VOCs in Air](#)

Click [here](#) to report this email as spam.

Sample Receipt Advice

Company name: **Coffey Geotechnics Pty Ltd Chatswood**

Contact name: Simon Hay
Project name: MANN ST GOSFORD
Project ID: SYDGE214942
COC number: Not provided
Turn around time: 5 Day
Date/Time received: Feb 28, 2018 12:50 PM
Eurofins | mgt reference: **586989**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 1.5 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Sample containers for volatile analysis received with zero headspace.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.

Notes N/A Custody Seals intact (if used).

R2: 2 vials, 1 250mL amber, 50mL FFmetal bottles received instead of R1; extra BH4_0.3-0.6: acid sulphate bag received placed on hold; Broken vial TS3 received.

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Simon Hay - simon.hay@coffey.com.

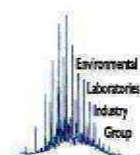
Note: A copy of these results will also be delivered to the general Coffey Geotechnics Pty Ltd Chatswood email address.



Environmental Laboratory
Air Analysis
Water Analysis
Soil Contamination Analysis

NATA Accreditation
Stack Emission Sampling & Analysis
Trade Waste Sampling & Analysis
Groundwater Sampling & Analysis

38 Years of Environmental Analysis & Experience



Certificate of Analysis



Accredited for compliance with ISO/IEC 17025-Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Attention: Simon Hay
Report 586989-AID
Project Name MANN ST GOSFORD
Project ID SYDGE214942
Received Date Feb 28, 2018
Date Reported Mar 07, 2018

Methodology:

Asbestos Fibre
 Identification

Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques.

NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.

Unknown Mineral
 Fibres

Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity.

NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.

Subsampling Soil
 Samples

The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed.

NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.

Bonded asbestos-
 containing material
 (ACM)

The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination. The resultant material is then further examined in accordance with AS 4964 - 2004.

NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.

Limit of Reporting

The performance limitation of the AS4964 method for inhomogeneous samples is around 0.1 g/kg (0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis where required, this is considered to be at the nominal reporting limit of 0.01 % (w / w). The examination of large sample sizes (500 mL is recommended) may improve the likelihood of identifying ACM in the > 2mm fraction. The NEPM screening level of 0.001 % (w / w) asbestos in soil for FA (friable asbestos) and AF (asbestos fines) then applies where they are able to be quantified by gravimetric procedures. This quantitative screening is not generally applicable to FF (free fibres) and results of Trace Analysis are referred.

NOTE: NATA News March 2014, p.7, states in relation to AS4964: "This is a qualitative method with a nominal reporting limit of 0.01%" and that currently in Australia "there is no validated method available for the quantification of asbestos". Accordingly, NATA Accreditation does not cover the performance of this service (indicated with an asterisk). This report is consistent with the analytical procedures and reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended) and the Western Australia Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia, 2009, including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil, June 2011.

Project Name MANN ST GOSFORD
Project ID SYDGE214942
Date Sampled Feb 27, 2018
Report 586989-AID

Client Sample ID	Eurofins mgt Sample No.	Date Sampled	Sample Description	Result
S1	18-Fe32718	Feb 27, 2018	Approximate Sample 1725g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
S2	18-Fe32719	Feb 27, 2018	Approximate Sample 1282g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
S3	18-Fe32720	Feb 27, 2018	Approximate Sample 1172g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
S4	18-Fe32721	Feb 27, 2018	Approximate Sample 972g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
S5	18-Fe32722	Feb 27, 2018	Approximate Sample 910g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.

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 (regarding both quality and NATA accreditation).

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
Asbestos - LTM-ASB-8020	Sydney	Feb 28, 2018	Indefinite

Company Name: Coffey Geotechnics Pty Ltd Chatswood
Address: Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: MANN ST GOSFORD
Project ID: SYDGE214942

Order No.:
Report #: 586989
Phone: +61 2 9406 1000
Fax: +61 2 9406 1002

Received: Feb 28, 2018 12:50 PM
Due: Mar 7, 2018
Priority: 5 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	HOLD	Metals M8	Metals M8 filtered	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
External Laboratory													
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID								
1	S1	Feb 27, 2018		Soil	S18-Fe32718	X							
2	S2	Feb 27, 2018		Soil	S18-Fe32719	X							
3	S3	Feb 27, 2018		Soil	S18-Fe32720	X							
4	S4	Feb 27, 2018		Soil	S18-Fe32721	X							
5	S5	Feb 27, 2018		Soil	S18-Fe32722	X							
6	R1	Feb 27, 2018		Water	S18-Fe32723				X	X		X	
7	BH4 0.0-0.3	Feb 27, 2018		Soil	S18-Fe32724			X		X	X	X	
8	BH4 1.8-0.2	Feb 27, 2018		Soil	S18-Fe32725			X		X	X	X	
9	BH4 2.5-2.7	Feb 27, 2018		Soil	S18-Fe32726			X		X	X	X	

Company Name: Coffey Geotechnics Pty Ltd Chatswood
Address: Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: MANN ST GOSFORD
Project ID: SYDGE214942

Order No.:
Report #: 586989
Phone: +61 2 9406 1000
Fax: +61 2 9406 1002

Received: Feb 28, 2018 12:50 PM
Due: Mar 7, 2018
Priority: 5 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	HOLD	Metals M8	Metals M8 filtered	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
10	TS3	Feb 27, 2018		Soil	S18-Fe32727								X
11	TB3	Feb 27, 2018		Soil	S18-Fe32728								X
12	BH4 0.3-0.6	Feb 27, 2018		Soil	S18-Fe33849		X						
Test Counts						5	1	3	1	4	3	4	2

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. 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 Sample Receipt Advice.

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.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Western Australia Department of Health
NOHSC	National Occupational Health and Safety Commission
ACM	Bonded asbestos-containing material means any material containing more than 1% asbestos and comprises asbestos-containing-material which is in sound condition, although possibly broken or fragmented, and where the asbestos is bound in a matrix such as cement or resin. Common examples of ACM include but are not limited to: pipe and boiler insulation, sprayed-on fireproofing, troweled-on acoustical plaster, floor tile and mastic, floor linoleum, transite shingles, roofing materials, wall and ceiling plaster, ceiling tiles, and gasket materials. This term is restricted to material that cannot pass a 7 mm x 7 mm sieve. This sieve size is selected because it approximates the thickness of common asbestos cement sheeting and for fragments to be smaller than this would imply a high degree of damage and hence potential for fibre release.
FA	FA comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. This material is typically unbonded or was previously bonded and is now significantly degraded (crumbling).
PACM	Presumed Asbestos-Containing Material means thermal system insulation and surfacing material found in buildings, vessels, and vessel sections constructed no later than 1980 that are assumed to contain greater than one percent asbestos but have not been sampled or analyzed to verify or negate the presence of asbestos.
AF	Asbestos fines (AF) are defined as free fibres, or fibre bundles, smaller than 7mm. It is the free fibres which present the greatest risk to human health, although very small fibres (< 5 microns in length) are not considered to be such a risk. AF also includes small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve. (Note that for bonded ACM fragments to pass through a 7 mm x 7 mm sieve implies a substantial degree of damage which increases the potential for fibre release.)
AC	Asbestos cement means a mixture of cement and asbestos fibres (typically 90:10 ratios).

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

Comments

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Laxman Dias Senior Analyst-Asbestos (NSW)

Authorised by:

Matthew Quigley Senior Analyst-Asbestos (NSW)



Glenn Jackson

National Operations Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

Uncertainty data is available on request

Eurofins | mgt shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins | mgt be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Certificate of Analysis

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Simon Hay

Report 586989-S
Project name MANN ST GOSFORD
Project ID SYDGE214942
Received Date Feb 28, 2018

Client Sample ID			BH4_0.0-0.3	BH4_1.8-0.2	BH4_2.5-2.7	R20 TS3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Fe32724	S18-Fe32725	S18-Fe32726	S18-Fe32727
Date Sampled			Feb 27, 2018	Feb 27, 2018	Feb 27, 2018	Feb 27, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	120
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	100
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	-
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	-
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	-
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	-
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	-
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	95
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	-
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	-
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	-
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	90
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	99
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	110
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	110
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	110
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	110
4-Bromofluorobenzene (surr.)	1	%	95	78	71	108
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	-
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-

Client Sample ID			BH4_0.0-0.3	BH4_1.8-0.2	BH4_2.5-2.7	R20 TS3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Fe32724	S18-Fe32725	S18-Fe32726	S18-Fe32727
Date Sampled			Feb 27, 2018	Feb 27, 2018	Feb 27, 2018	Feb 27, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	96	96	91	-
p-Terphenyl-d14 (surr.)	1	%	102	102	90	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
4,4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
4,4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
4,4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Toxaphene	1	mg/kg	< 1	< 1	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Dibutylchlorendate (surr.)	1	%	109	86	74	-
Tetrachloro-m-xylene (surr.)	1	%	135	99	93	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Dibutylchlorendate (surr.)	1	%	109	86	74	-
Tetrachloro-m-xylene (surr.)	1	%	135	99	93	-

Client Sample ID			BH4_0.0-0.3	BH4_1.8-0.2	BH4_2.5-2.7	R20-TS3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Fe32724	S18-Fe32725	S18-Fe32726	S18-Fe32727
Date Sampled			Feb 27, 2018	Feb 27, 2018	Feb 27, 2018	Feb 27, 2018
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	< 2	2.3	< 2	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	-
Chromium	5	mg/kg	< 5	62	< 5	-
Copper	5	mg/kg	< 5	29	< 5	-
Lead	5	mg/kg	< 5	9.2	< 5	-
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Nickel	5	mg/kg	< 5	70	< 5	-
Zinc	5	mg/kg	< 5	36	< 5	-
% Moisture	1	%	8.8	11	18	-

Client Sample ID			TB3
Sample Matrix			Soil
Eurofins mgt Sample No.			S18-Fe32728
Date Sampled			Feb 27, 2018
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene ^{N02}	0.5	mg/kg	< 0.5
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	20	mg/kg	< 20
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	%	89

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 (regarding both quality and NATA accreditation).

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
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Mar 05, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons	Sydney	Mar 05, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Mar 05, 2018	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Mar 05, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Eurofins mgt Suite B4			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Mar 05, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Sydney	Mar 05, 2018	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soils by GCMS			
Organochlorine Pesticides	Sydney	Mar 05, 2018	14 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Sydney	Mar 05, 2018	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Metals M8	Sydney	Mar 05, 2018	28 Day
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	Feb 28, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

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Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	HOLD	Metals M8	Metals M8 filtered	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
External Laboratory													
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID								
1	S1	Feb 27, 2018		Soil	S18-Fe32718	X							
2	S2	Feb 27, 2018		Soil	S18-Fe32719	X							
3	S3	Feb 27, 2018		Soil	S18-Fe32720	X							
4	S4	Feb 27, 2018		Soil	S18-Fe32721	X							
5	S5	Feb 27, 2018		Soil	S18-Fe32722	X							
6	R1	Feb 27, 2018		Water	S18-Fe32723				X	X		X	
7	BH4 0.0-0.3	Feb 27, 2018		Soil	S18-Fe32724			X		X	X	X	
8	BH4 1.8-0.2	Feb 27, 2018		Soil	S18-Fe32725			X		X	X	X	
9	BH4 2.5-2.7	Feb 27, 2018		Soil	S18-Fe32726			X		X	X	X	

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Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	HOLD	Metals M8	Metals M8 filtered	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
10	TS3	Feb 27, 2018		Soil	S18-Fe32727								X
11	TB3	Feb 27, 2018		Soil	S18-Fe32728								X
12	BH4 0.3-0.6	Feb 27, 2018		Soil	S18-Fe33849		X						
Test Counts						5	1	3	1	4	3	4	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota 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. 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	Quality Systems Manual ver 5.1 US Department of Defense
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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. 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 - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
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							
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							
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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	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 - 2013 NEPM Fractions							
Naphthalene	%	125			70-130	Pass	
Naphthalene	%	125			70-130	Pass	
TRH C6-C10	%	100			70-130	Pass	
TRH C6-C10	%	100			70-130	Pass	
TRH >C10-C16	%	81			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	104			70-130	Pass	
TRH C10-C14	%	73			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	124			70-130	Pass	
Toluene	%	101			70-130	Pass	
Ethylbenzene	%	104			70-130	Pass	
m&p-Xylenes	%	106			70-130	Pass	
o-Xylene	%	103			70-130	Pass	
Xylenes - Total	%	105			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	99			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Acenaphthylene	%	97			70-130	Pass	
Anthracene	%	105			70-130	Pass	
Benz(a)anthracene	%	100			70-130	Pass	
Benzo(a)pyrene	%	103			70-130	Pass	
Benzo(b&j)fluoranthene	%	103			70-130	Pass	
Benzo(g,h,i)perylene	%	103			70-130	Pass	
Benzo(k)fluoranthene	%	105			70-130	Pass	
Chrysene	%	100			70-130	Pass	
Dibenz(a,h)anthracene	%	103			70-130	Pass	
Fluoranthene	%	104			70-130	Pass	
Fluorene	%	99			70-130	Pass	
Indeno(1,2,3-cd)pyrene	%	102			70-130	Pass	
Naphthalene	%	87			70-130	Pass	
Phenanthrene	%	99			70-130	Pass	
Pyrene	%	107			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4,4'-DDD	%	112			70-130	Pass	
4,4'-DDE	%	116			70-130	Pass	
4,4'-DDT	%	128			70-130	Pass	
a-BHC	%	113			70-130	Pass	
Aldrin	%	115			70-130	Pass	
b-BHC	%	106			70-130	Pass	
d-BHC	%	112			70-130	Pass	
Dieldrin	%	125			70-130	Pass	
Endosulfan I	%	109			70-130	Pass	
Endosulfan II	%	108			70-130	Pass	
Endosulfan sulphate	%	116			70-130	Pass	
Endrin	%	116			70-130	Pass	
Endrin aldehyde	%	108			70-130	Pass	
Endrin ketone	%	118			70-130	Pass	
g-BHC (Lindane)	%	115			70-130	Pass	
Heptachlor	%	113			70-130	Pass	
Heptachlor epoxide	%	111			70-130	Pass	
Hexachlorobenzene	%	101			70-130	Pass	
Methoxychlor	%	122			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	112			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	108			70-130	Pass	
Cadmium	%	108			70-130	Pass	
Chromium	%	114			70-130	Pass	
Copper	%	116			70-130	Pass	
Lead	%	111			70-130	Pass	
Mercury	%	109			70-130	Pass	
Nickel	%	118			70-130	Pass	
Zinc	%	91			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1				
Naphthalene	S18-Ma02526	NCP	%	113		70-130	Pass	
Naphthalene	S18-Ma02526	NCP	%	113		70-130	Pass	
TRH C6-C10	S18-Ma02526	NCP	%	124		70-130	Pass	
TRH C6-C10	S18-Ma02526	NCP	%	124		70-130	Pass	
TRH >C10-C16	S18-Ma04225	NCP	%	112		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1				
TRH C6-C9	S18-Ma02526	NCP	%	128		70-130	Pass	
TRH C10-C14	S18-Ma04225	NCP	%	107		70-130	Pass	
Spike - % Recovery								
BTEX				Result 1				
Benzene	S18-Ma02526	NCP	%	128		70-130	Pass	
Toluene	S18-Ma02526	NCP	%	95		70-130	Pass	
Ethylbenzene	S18-Ma02526	NCP	%	97		70-130	Pass	
m&p-Xylenes	S18-Ma02526	NCP	%	96		70-130	Pass	
o-Xylene	S18-Ma02526	NCP	%	95		70-130	Pass	
Xylenes - Total	S18-Ma02526	NCP	%	96		70-130	Pass	
Spike - % Recovery								
Organochlorine Pesticides				Result 1				
4,4'-DDD	S18-Ma02527	NCP	%	114		70-130	Pass	
4,4'-DDE	S18-Ma02527	NCP	%	96		70-130	Pass	
a-BHC	S18-Ma02527	NCP	%	96		70-130	Pass	
Aldrin	S18-Ma02527	NCP	%	93		70-130	Pass	
b-BHC	S18-Ma02527	NCP	%	92		70-130	Pass	
d-BHC	S18-Ma02527	NCP	%	86		70-130	Pass	
Dieldrin	S18-Ma02527	NCP	%	102		70-130	Pass	
Endosulfan I	S18-Ma02527	NCP	%	92		70-130	Pass	
Endosulfan II	S18-Ma02527	NCP	%	82		70-130	Pass	
Endosulfan sulphate	S18-Ma02527	NCP	%	80		70-130	Pass	
Endrin	S18-Ma02527	NCP	%	79		70-130	Pass	
Endrin aldehyde	S18-Ma02527	NCP	%	81		70-130	Pass	
Endrin ketone	S18-Ma02527	NCP	%	92		70-130	Pass	
g-BHC (Lindane)	S18-Ma02527	NCP	%	96		70-130	Pass	
Heptachlor	S18-Ma02527	NCP	%	79		70-130	Pass	
Heptachlor epoxide	S18-Ma02527	NCP	%	92		70-130	Pass	
Hexachlorobenzene	S18-Ma02527	NCP	%	84		70-130	Pass	
Spike - % Recovery								
Polychlorinated Biphenyls				Result 1				
Aroclor-1260	S18-Ma02527	NCP	%	111		70-130	Pass	
Spike - % Recovery								
Heavy Metals				Result 1				
Arsenic	S18-Ma02527	NCP	%	129		70-130	Pass	
Cadmium	S18-Ma02527	NCP	%	108		70-130	Pass	
Chromium	S18-Ma02527	NCP	%	127		70-130	Pass	
Copper	S18-Ma00602	NCP	%	87		70-130	Pass	
Lead	S18-Ma00602	NCP	%	129		70-130	Pass	
Mercury	S18-Ma02527	NCP	%	127		70-130	Pass	
Nickel	S18-Ma02527	NCP	%	128		70-130	Pass	
Zinc	S18-Ma00602	NCP	%	77		70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S18-Fe32724	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S18-Fe32724	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S18-Ma04821	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S18-Ma04821	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S18-Ma04821	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S18-Fe32724	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S18-Ma04821	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S18-Ma04821	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S18-Ma04821	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S18-Fe32724	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S18-Fe32724	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S18-Fe32724	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S18-Fe32724	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S18-Fe32724	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S18-Fe32724	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S18-Ma05645	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S18-Ma05645	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S18-Ma05645	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S18-Ma05645	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S18-Ma05645	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S18-Ma05645	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g,h,i)perylene	S18-Ma05645	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S18-Ma05645	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S18-Ma05645	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a,h)anthracene	S18-Ma05645	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S18-Ma05645	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S18-Ma05645	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1,2,3-cd)pyrene	S18-Ma05645	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S18-Ma05645	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S18-Ma05645	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S18-Ma05645	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S18-Ma02526	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4,4'-DDD	S18-Ma02526	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4,4'-DDE	S18-Ma02526	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4,4'-DDT	S18-Ma02526	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S18-Ma02526	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S18-Ma02526	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S18-Ma02526	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S18-Ma02526	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S18-Ma02526	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S18-Ma02526	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S18-Ma02526	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S18-Ma02526	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S18-Ma02526	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate								
Organochlorine Pesticides				Result 1	Result 2	RPD		
Endrin aldehyde	S18-Ma02526	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin ketone	S18-Ma02526	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
g-BHC (Lindane)	S18-Ma02526	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor	S18-Ma02526	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor epoxide	S18-Ma02526	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Hexachlorobenzene	S18-Ma02526	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Methoxychlor	S18-Ma02526	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Toxaphene	S18-Ma02526	NCP	mg/kg	< 1	< 1	<1	30%	Pass
Duplicate								
Polychlorinated Biphenyls				Result 1	Result 2	RPD		
Aroclor-1016	S18-Ma02526	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1221	S18-Ma02526	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1232	S18-Ma02526	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1242	S18-Ma02526	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1248	S18-Ma02526	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1254	S18-Ma02526	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1260	S18-Ma02526	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	S18-Ma02526	NCP	mg/kg	13	15	9.0	30%	Pass
Cadmium	S18-Ma02526	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	S18-Ma02526	NCP	mg/kg	25	28	11	30%	Pass
Copper	S18-Ma02526	NCP	mg/kg	29	32	10	30%	Pass
Lead	S18-Ma02526	NCP	mg/kg	150	170	10	30%	Pass
Mercury	S18-Ma02526	NCP	mg/kg	0.2	0.2	5.0	30%	Pass
Nickel	S18-Ma02526	NCP	mg/kg	14	15	11	30%	Pass
Zinc	S18-Ma02526	NCP	mg/kg	190	210	9.0	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	S18-Fe32724	CP	%	8.8	8.8	<1	30%	Pass

Comments

Sample Integrity

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

Comments

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
R20	This sample is a Trip Spike and therefore all results are reported as a percentage

Authorised By

Nibha Vaidya	Analytical Services Manager
Nibha Vaidya	Senior Analyst-Asbestos (NSW)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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Certificate of Analysis

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Simon Hay

Report 586989-W
Project name MANN ST GOSFORD
Project ID SYDGE214942
Received Date Feb 28, 2018

Client Sample ID			R1
Sample Matrix			Water
Eurofins mgt Sample No.			S18-Fe32723
Date Sampled			Feb 27, 2018
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	0.02	mg/L	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1
TRH C10-36 (Total)	0.1	mg/L	< 0.1
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003
4-Bromofluorobenzene (surr.)	1	%	65
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene ^{N02}	0.01	mg/L	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1
Polycyclic Aromatic Hydrocarbons			
Acenaphthene	0.001	mg/L	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001
Anthracene	0.001	mg/L	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001
Chrysene	0.001	mg/L	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001
Fluoranthene	0.001	mg/L	< 0.001
Fluorene	0.001	mg/L	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001

Client Sample ID			R1
Sample Matrix			Water
Eurofins mgt Sample No.			S18-Fe32723
Date Sampled			Feb 27, 2018
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Naphthalene	0.001	mg/L	< 0.001
Phenanthrene	0.001	mg/L	< 0.001
Pyrene	0.001	mg/L	< 0.001
Total PAH*	0.001	mg/L	< 0.001
2-Fluorobiphenyl (surr.)	1	%	70
p-Terphenyl-d14 (surr.)	1	%	95
Organochlorine Pesticides			
Chlordanes - Total	0.001	mg/L	< 0.001
4,4'-DDD	0.0001	mg/L	< 0.0001
4,4'-DDE	0.0001	mg/L	< 0.0001
4,4'-DDT	0.0001	mg/L	< 0.0001
α-BHC	0.0001	mg/L	< 0.0001
Aldrin	0.0001	mg/L	< 0.0001
β-BHC	0.0001	mg/L	< 0.0001
δ-BHC	0.0001	mg/L	< 0.0001
Dieldrin	0.0001	mg/L	< 0.0001
Endosulfan I	0.0001	mg/L	< 0.0001
Endosulfan II	0.0001	mg/L	< 0.0001
Endosulfan sulphate	0.0001	mg/L	< 0.0001
Endrin	0.0001	mg/L	< 0.0001
Endrin aldehyde	0.0001	mg/L	< 0.0001
Endrin ketone	0.0001	mg/L	< 0.0001
γ-BHC (Lindane)	0.0001	mg/L	< 0.0001
Heptachlor	0.0001	mg/L	< 0.0001
Heptachlor epoxide	0.0001	mg/L	< 0.0001
Hexachlorobenzene	0.0001	mg/L	< 0.0001
Methoxychlor	0.0001	mg/L	< 0.0001
Toxaphene	0.01	mg/L	< 0.01
Aldrin and Dieldrin (Total)*	0.0001	mg/L	< 0.0001
DDT + DDE + DDD (Total)*	0.0001	mg/L	< 0.0001
Vic EPA IWRG 621 OCP (Total)*	0.001	mg/L	< 0.001
Vic EPA IWRG 621 Other OCP (Total)*	0.001	mg/L	< 0.001
Dibutylchloroendate (surr.)	1	%	110
Tetrachloro-m-xylene (surr.)	1	%	70
Polychlorinated Biphenyls			
Aroclor-1016	0.005	mg/L	< 0.005
Aroclor-1221	0.001	mg/L	< 0.001
Aroclor-1232	0.005	mg/L	< 0.005
Aroclor-1242	0.005	mg/L	< 0.005
Aroclor-1248	0.005	mg/L	< 0.005
Aroclor-1254	0.005	mg/L	< 0.005
Aroclor-1260	0.005	mg/L	< 0.005
Total PCB*	0.001	mg/L	< 0.001
Dibutylchloroendate (surr.)	1	%	110
Tetrachloro-m-xylene (surr.)	1	%	70

Client Sample ID			R1
Sample Matrix			Water
Eurofins mgt Sample No.			S18-Fe32723
Date Sampled			Feb 27, 2018
Test/Reference	LOR	Unit	
Heavy Metals			
Arsenic (filtered)	0.001	mg/L	< 0.001
Cadmium (filtered)	0.0002	mg/L	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001
Copper (filtered)	0.001	mg/L	< 0.001
Lead (filtered)	0.001	mg/L	< 0.001
Mercury (filtered)	0.0001	mg/L	0.0003
Nickel (filtered)	0.001	mg/L	< 0.001
Zinc (filtered)	0.005	mg/L	0.018

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 (regarding both quality and NATA accreditation).

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
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: TRH C6-C36 - LTM-ORG-2010	Sydney	Feb 28, 2018	7 Day
BTEX - Method: TRH C6-C40 - LTM-ORG-2010	Sydney	Feb 28, 2018	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Sydney	Feb 28, 2018	7 Day
Eurofins mgt Suite B4			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Sydney	Feb 28, 2018	7 Day
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Water by GCMS	Sydney	Feb 28, 2018	7 Days
Organochlorine Pesticides - Method: LTM-ORG-2220 OCP & PCB in Soil and Water	Sydney	Feb 28, 2018	7 Day
Polychlorinated Biphenyls - Method: LTM-ORG-2220 OCP & PCB in Soil and Water	Sydney	Feb 28, 2018	7 Days
Metals M8 filtered - Method: LTM-MET-3040 Metals in Waters by ICP-MS	Sydney	Mar 01, 2018	28 Day

Company Name: Coffey Geotechnics Pty Ltd Chatswood
Address: Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: MANN ST GOSFORD
Project ID: SYDGE214942

Order No.:
Report #: 586989
Phone: +61 2 9406 1000
Fax: +61 2 9406 1002

Received: Feb 28, 2018 12:50 PM
Due: Mar 7, 2018
Priority: 5 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	HOLD	Metals M8	Metals M8 filtered	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
External Laboratory													
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID								
1	S1	Feb 27, 2018		Soil	S18-Fe32718	X							
2	S2	Feb 27, 2018		Soil	S18-Fe32719	X							
3	S3	Feb 27, 2018		Soil	S18-Fe32720	X							
4	S4	Feb 27, 2018		Soil	S18-Fe32721	X							
5	S5	Feb 27, 2018		Soil	S18-Fe32722	X							
6	R1	Feb 27, 2018		Water	S18-Fe32723				X	X		X	
7	BH4_0.0-0.3	Feb 27, 2018		Soil	S18-Fe32724			X		X	X	X	
8	BH4_1.8-0.2	Feb 27, 2018		Soil	S18-Fe32725			X		X	X	X	
9	BH4_2.5-2.7	Feb 27, 2018		Soil	S18-Fe32726			X		X	X	X	

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Sample Detail						Asbestos - WA guidelines	HOLD	Metals M8	Metals M8 filtered	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271													
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
10	TS3	Feb 27, 2018		Soil	S18-Fe32727								X
11	TB3	Feb 27, 2018		Soil	S18-Fe32728								X
12	BH4 0.3-0.6	Feb 27, 2018		Soil	S18-Fe33849		X						
Test Counts						5	1	3	1	4	3	4	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota 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. 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	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NC	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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. 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/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g,h,i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a,h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1,2,3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/L	< 0.001			0.001	Pass	
4,4'-DDD	mg/L	< 0.0001			0.0001	Pass	
4,4'-DDE	mg/L	< 0.0001			0.0001	Pass	
4,4'-DDT	mg/L	< 0.0001			0.0001	Pass	
a-BHC	mg/L	< 0.0001			0.0001	Pass	
Aldrin	mg/L	< 0.0001			0.0001	Pass	
b-BHC	mg/L	< 0.0001			0.0001	Pass	
d-BHC	mg/L	< 0.0001			0.0001	Pass	
Dieldrin	mg/L	< 0.0001			0.0001	Pass	
Endosulfan I	mg/L	< 0.0001			0.0001	Pass	
Endosulfan II	mg/L	< 0.0001			0.0001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/L	< 0.0001			0.0001	Pass	
Endrin	mg/L	< 0.0001			0.0001	Pass	
Endrin aldehyde	mg/L	< 0.0001			0.0001	Pass	
Endrin ketone	mg/L	< 0.0001			0.0001	Pass	
g-BHC (Lindane)	mg/L	< 0.0001			0.0001	Pass	
Heptachlor	mg/L	< 0.0001			0.0001	Pass	
Heptachlor epoxide	mg/L	< 0.0001			0.0001	Pass	
Hexachlorobenzene	mg/L	< 0.0001			0.0001	Pass	
Methoxychlor	mg/L	< 0.0001			0.0001	Pass	
Toxaphene	mg/L	< 0.01			0.01	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/L	< 0.005			0.005	Pass	
Aroclor-1221	mg/L	< 0.001			0.001	Pass	
Aroclor-1232	mg/L	< 0.005			0.005	Pass	
Aroclor-1242	mg/L	< 0.005			0.005	Pass	
Aroclor-1248	mg/L	< 0.005			0.005	Pass	
Aroclor-1254	mg/L	< 0.005			0.005	Pass	
Aroclor-1260	mg/L	< 0.005			0.005	Pass	
Total PCB*	mg/L	< 0.001			0.001	Pass	
Method Blank							
Heavy Metals							
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	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	88			70-130	Pass	
TRH C10-C14	%	102			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	90			70-130	Pass	
Toluene	%	97			70-130	Pass	
Ethylbenzene	%	94			70-130	Pass	
m&p-Xylenes	%	100			70-130	Pass	
o-Xylene	%	99			70-130	Pass	
Xylenes - Total	%	100			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	100			70-130	Pass	
TRH C6-C10	%	91			70-130	Pass	
TRH >C10-C16	%	105			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	70			70-130	Pass	
Acenaphthylene	%	79			70-130	Pass	
Anthracene	%	88			70-130	Pass	
Benz(a)anthracene	%	77			70-130	Pass	
Benzo(a)pyrene	%	73			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(b&j)fluoranthene			%	81			70-130	Pass	
Benzo(g,h,i)perylene			%	72			70-130	Pass	
Benzo(k)fluoranthene			%	73			70-130	Pass	
Chrysene			%	79			70-130	Pass	
Dibenz(a,h)anthracene			%	79			70-130	Pass	
Fluoranthene			%	79			70-130	Pass	
Fluorene			%	79			70-130	Pass	
Indeno(1,2,3-cd)pyrene			%	78			70-130	Pass	
Naphthalene			%	74			70-130	Pass	
Phenanthrene			%	85			70-130	Pass	
Pyrene			%	77			70-130	Pass	
LCS - % Recovery									
Organochlorine Pesticides									
4,4'-DDD			%	106			70-130	Pass	
4,4'-DDE			%	102			70-130	Pass	
4,4'-DDT			%	106			70-130	Pass	
a-BHC			%	78			70-130	Pass	
Aldrin			%	72			70-130	Pass	
b-BHC			%	82			70-130	Pass	
d-BHC			%	88			70-130	Pass	
Dieldrin			%	92			70-130	Pass	
Endosulfan I			%	96			70-130	Pass	
Endosulfan II			%	106			70-130	Pass	
Endosulfan sulphate			%	102			70-130	Pass	
Endrin			%	99			70-130	Pass	
Endrin aldehyde			%	91			70-130	Pass	
Endrin ketone			%	104			70-130	Pass	
g-BHC (Lindane)			%	83			70-130	Pass	
Heptachlor			%	82			70-130	Pass	
Heptachlor epoxide			%	90			70-130	Pass	
Hexachlorobenzene			%	72			70-130	Pass	
Methoxychlor			%	118			70-130	Pass	
LCS - % Recovery									
Polychlorinated Biphenyls									
Aroclor-1260			%	107			70-130	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic (filtered)			%	86			70-130	Pass	
Cadmium (filtered)			%	104			70-130	Pass	
Chromium (filtered)			%	107			70-130	Pass	
Copper (filtered)			%	103			70-130	Pass	
Lead (filtered)			%	107			70-130	Pass	
Mercury (filtered)			%	110			70-130	Pass	
Nickel (filtered)			%	103			70-130	Pass	
Zinc (filtered)			%	79			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals									
				Result 1					
Arsenic (filtered)		S18-Ma06202	NCP	%	106		70-130	Pass	
Cadmium (filtered)		S18-Ma06202	NCP	%	103		70-130	Pass	
Chromium (filtered)		S18-Ma06202	NCP	%	102		70-130	Pass	
Copper (filtered)		S18-Ma06202	NCP	%	87		70-130	Pass	
Lead (filtered)		S18-Ma06202	NCP	%	92		70-130	Pass	
Mercury (filtered)		M18-Ma05394	NCP	%	97		70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Nickel (filtered)	S18-Ma06202	NCP	%	88			70-130	Pass	
Zinc (filtered)	M18-Ma05394	NCP	%	79			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	S18-Fe33470	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S18-Fe33470	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S18-Fe33470	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S18-Fe33470	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S18-Fe33470	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S18-Fe33470	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	S18-Fe33470	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S18-Fe33470	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	S18-Fe33470	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	S18-Ma06201	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium (filtered)	S18-Ma06201	NCP	mg/L	0.0002	0.0002	14	30%	Pass	
Chromium (filtered)	S18-Ma06201	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	S18-Ma06201	NCP	mg/L	0.027	0.027	2.0	30%	Pass	
Lead (filtered)	S18-Ma06201	NCP	mg/L	0.042	0.041	1.0	30%	Pass	
Mercury (filtered)	M18-Ma05393	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	S18-Ma06201	NCP	mg/L	0.078	0.076	3.0	30%	Pass	
Zinc (filtered)	S18-Ma06201	NCP	mg/L	0.14	0.13	3.0	30%	Pass	

Comments

Sample Integrity

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

Comments

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

Authorised By

Nibha Vaidya Analytical Services Manager



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins | mgt shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins | mgt be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Coffey Environments Version: 4 Issue Date: 23/08/2012

Sample Receipt Advice

Company name: **Coffey Environments Pty Ltd NSW**

Contact name: Simon Hay
Project name: MANN ST GOSFORD
Project ID: SYDGE214942
COC number: Not provided
Turn around time: 1 Day
Date/Time received: Mar 2, 2018 5:32 PM
Eurofins | mgt reference: **587543**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt
Sample Receipt : 23 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Simon Hay - simon.hay@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Environments Pty Ltd NSW email address.

Certificate of Analysis

Coffey Environments Pty Ltd NSW
Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: **Simon Hay**

Report **587543-S-V2**
 Project name MANN ST GOSFORD
 Project ID SYDGE214942
 Received Date Mar 02, 2018

Client Sample ID			BH5_1.6-1.8	BH5_2.6-2.7	P1_1.7-2.2
Sample Matrix			Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Ma02812	S18-Ma02813	S18-Ma02814
Date Sampled			Feb 28, 2018	Feb 28, 2018	Feb 28, 2018
Test/Reference	LOR	Unit			
Acid Sulfate Soils Field pH Test					
pH-F (Field pH test)*	0.1	pH Units	7.2	7.7	6.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.3	4.5	3.7
Reaction Ratings* ^{S05}		comment	4.0	2.0	4.0

Sample History

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

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

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

Acid Sulfate Soils Field pH Test

Testing Site

Sydney

Extracted

Mar 05, 2018

Holding Time

7 Days

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

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: MANN ST GOSFORD
Project ID: SYDGE214942

Order No.:
Report #: 587543
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Mar 2, 2018 5:32 PM
Due: Mar 5, 2018
Priority: 1 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Acid Sulfate Soils Field pH Test
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						X
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						
External Laboratory						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID	
1	BH5 1.6-1.8	Feb 28, 2018		Soil	S18-Ma02812	X
2	BH5 2.6-2.7	Feb 28, 2018		Soil	S18-Ma02813	X
3	P1 1.7-2.2	Feb 28, 2018		Soil	S18-Ma02814	X
Test Counts						3

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota 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. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

ug/L: micrograms per litre

ppb: Parts per billion

org/100mL: Organisms per 100 millilitres

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

mg/L: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

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	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NC	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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. 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.

Comments

The report has been revised (V2) to amend sample descriptions

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

Comments

Qualifier Codes/Comments

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

Authorised By

Nibha Vaidya Analytical Services Manager



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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Issue Date: 23/08/2012

Sample Receipt Advice

Company name: **Coffey Environments Pty Ltd NSW**

Contact name: Simon Hay
Project name: MANN ST GOSFORD
Project ID: SYDGE214942
COC number: Not provided
Turn around time: 1 Day
Date/Time received: Mar 2, 2018 5:32 PM
Eurofins | mgt reference: **587545**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt
Sample Receipt : 23 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Simon Hay - simon.hay@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Environments Pty Ltd NSW email address.

Certificate of Analysis

Coffey Environments Pty Ltd NSW
Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: **Simon Hay**

Report **587545-S-V2**
 Project name MANN ST GOSFORD
 Project ID SYDGE214942
 Received Date Mar 02, 2018

Client Sample ID			P2_1.1-1.2	P2_2-2.2	P3_2.4-2.6
Sample Matrix			Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Ma02829	S18-Ma02830	S18-Ma02831
Date Sampled			Feb 27, 2018	Feb 27, 2018	Feb 27, 2018
Test/Reference	LOR	Unit			
Acid Sulfate Soils Field pH Test					
pH-F (Field pH test)*	0.1	pH Units	6.9	7.7	8.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.5	4.0	4.0
Reaction Ratings* ^{S05}		comment	3.0	2.0	2.0

Sample History

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

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

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

Acid Sulfate Soils Field pH Test

Testing Site

Sydney

Extracted

Mar 05, 2018

Holding Time

7 Days

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

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: MANN ST GOSFORD
Project ID: SYDGE214942

Order No.:
Report #: 587545
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Mar 2, 2018 5:32 PM
Due: Mar 5, 2018
Priority: 1 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Acid Sulfate Soils Field pH Test
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						X
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						
External Laboratory						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID	
1	P2_1.1-1.2	Feb 27, 2018		Soil	S18-Ma02829	X
2	P2_2-2.2	Feb 27, 2018		Soil	S18-Ma02830	X
3	P3_2.4-2.6	Feb 27, 2018		Soil	S18-Ma02831	X
Test Counts						3

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota 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. 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	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NC	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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. 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.

Comments

The report has been revised (V2) to amend sample descriptions

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

Comments

Qualifier Codes/Comments

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

Authorised By

Nibha Vaidya Analytical Services Manager



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins | mgt shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins | mgt be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Issue Date: 23/08/2012

Sample Receipt Advice

Company name: **Coffey Environments Pty Ltd NSW**

Contact name: Simon Hay
Project name: MANN ST GOSFORD
Project ID: SYDGE214942
COC number: Not provided
Turn around time: 1 Day
Date/Time received: Mar 2, 2018 5:32 PM
Eurofins | mgt reference: **587547**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt
Sample Receipt : 23 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Simon Hay - simon.hay@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Environments Pty Ltd NSW email address.

Certificate of Analysis

Coffey Environments Pty Ltd NSW
Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: **Simon Hay**

Report **587547-S-V2**
 Project name MANN ST GOSFORD
 Project ID SYDGE214942
 Received Date Mar 02, 2018

Client Sample ID			P4-0.8-1.8	P4-1.8-2.0	P4-2.0-3.0	P5-2-2.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Ma02832	S18-Ma02833	S18-Ma02834	S18-Ma02835
Date Sampled			Feb 27, 2018	Feb 27, 2018	Feb 27, 2018	Feb 27, 2018
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.0	8.2	6.9	7.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.7	4.7	4.4	3.2
Reaction Ratings* ^{S05}		comment	4.0	3.0	4.0	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 (regarding both quality and NATA accreditation).

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

Acid Sulfate Soils Field pH Test

Testing Site

Sydney

Extracted

Mar 05, 2018

Holding Time

7 Days

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

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: MANN ST GOSFORD
Project ID: SYDGE214942

Order No.:
Report #: 587547
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Mar 2, 2018 5:32 PM
Due: Mar 5, 2018
Priority: 1 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Acid Sulfate Soils Field pH Test
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						X
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						
External Laboratory						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID	
1	P4-0.8-1.8	Feb 27, 2018		Soil	S18-Ma02832	X
2	P4-1.8-2.0	Feb 27, 2018		Soil	S18-Ma02833	X
3	P4-2.0-3.0	Feb 27, 2018		Soil	S18-Ma02834	X
4	P5-2-2.2	Feb 27, 2018		Soil	S18-Ma02835	X
Test Counts						4

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota 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. 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	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NC	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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. 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.

Comments

The report has been revised (V2) to amend sample descriptions

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

Comments

Qualifier Codes/Comments

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

Authorised By

Nibha Vaidya Analytical Services Manager



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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coffey environments		SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE		Consigning Office: Chatswood		Report Results to: Simon Hay		Mobile: 0424 703 009 Email: simon.hay@coffey.com											
		Invoices to:		Simon Hay		Phone: 0427 643 063 Email: luke.steller@coffey.com													
Project No: SYDGE214942 Task No:								Analysis Request Section											
Project Name: Mann St Gosford Laboratory: Eurofins																			
Sampler's Name: Lily Project Manager: Simon Hay																			
Special Instructions:																			
								NOTES											
Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	Suite B4 (TRH, BTEX, PAH)	Suite M8 (Metals)	Suite B13 OCP, PCB	pH Fieldscreen pHif, pHfox	SPOCAS	TRH (C6-C10) & BTEX	Asbestos (40g)	Hold					
	P6-0.2-0.6	#####		soil	jar		X	X											
	P6-0.6-0.9	#####		soil	jar		X	X											
	P6-1.0-1.3	#####		soil	jar									X					
	P6_0.1-0.2	#####		soil	bag									X					
	P6_0.6-0.9	#####		soil	bag									X					
	P6_1-1.3	#####		soil	bag					X									
	P7_1.1-1.3	#####		soil	Jar		X	X											
	P7_1.5-1.8	#####		soil	Jar									X					
	P7-1.9-2.1	#####		soil	Jar									X					
	P7-0.1-0.3	#####		soil	Bag									X					
	P7-1.3-1.5	#####		soil	Bag					X									
	P7-2.1-2.3	#####		soil	Bag					X									
	P8-0.6-0.9	#####		soil	jar		X	X											
	P8-1.5-1.7	#####		soil	jar														
	P8-2.3-2.5	#####		soil	jar									X					
	P8-0.5-0.6	#####		soil	bag									X					
	P8-1.2-1.5	#####		soil	bag									X					
	P8-2-2.3	#####		soil	bag					X									
RELINQUISHED BY								RECEIVED BY				Sample Receipt Advice: (Lab Use Only)							
Name:	Date:		→	Name:	Date:		All Samples Recieved in Good Condition				☐								
Coffey Environments	Time:			Company:	Time:		All Documentation is in Proper Order				☐								
Name:	Date:		→	Name:	Date:		Samples Received Properly Chilled				☐								
Company:	Time:			Company:	Time:		Lab. Ref/Batch No.				#587548.								

Sample Receipt Advice

Company name: **Coffey Environments Pty Ltd NSW**

Contact name: Simon Hay
Project name: MANN ST GOSFORD
Project ID: SYDGE214942
COC number: Not provided
Turn around time: 1 Day
Date/Time received: Mar 2, 2018 5:32 PM
Eurofins | mgt reference: **587548**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 23 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Simon Hay - simon.hay@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Environments Pty Ltd NSW email address.

Certificate of Analysis

Coffey Environments Pty Ltd NSW
Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: **Simon Hay**

Report **587548-S-V2**
 Project name MANN ST GOSFORD
 Project ID SYDGE214942
 Received Date Mar 02, 2018

Client Sample ID			P6_1-1.3	P7_1.3-1.5	P7_2.1-2.3	P8_2-2.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Ma02870	S18-Ma02871	S18-Ma02872	S18-Ma02873
Date Sampled			Feb 28, 2018	Feb 28, 2018	Feb 28, 2018	Feb 28, 2018
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.5	6.8	7.4	10
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.5	4.2	3.6	8.4
Reaction Ratings* ^{S05}		comment	4.0	4.0	2.0	4.0

Sample History

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

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

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

Acid Sulfate Soils Field pH Test

Testing Site

Sydney

Extracted

Mar 05, 2018

Holding Time

7 Days

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

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Project Name: MANN ST GOSFORD
Project ID: SYDGE214942

Order No.:
Report #: 587548
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Mar 2, 2018 5:32 PM
Due: Mar 5, 2018
Priority: 1 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Acid Sulfate Soils Field pH Test
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						X
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						
External Laboratory						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID	
1	P6_1-1.3	Feb 28, 2018		Soil	S18-Ma02870	X
2	P7_1.3-1.5	Feb 28, 2018		Soil	S18-Ma02871	X
3	P7_2.1-2.3	Feb 28, 2018		Soil	S18-Ma02872	X
4	P8_2-2.3	Feb 28, 2018		Soil	S18-Ma02873	X
Test Counts						4

Internal Quality Control Review and Glossary

General

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2. All soil results are reported on a dry basis, unless otherwise stated.
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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. This report replaces any interim results previously issued.

Holding Times

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

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ug/L: micrograms per litre

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

Terms

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SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
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CP	Client Parent - QC was performed on samples pertaining to this report
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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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
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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.
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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.

Comments

The report has been revised (V2) to amend sample descriptions

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

Comments

Qualifier Codes/Comments

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

Authorised By

Nibha Vaidya Analytical Services Manager



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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environments SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE		Consigning Office: Chatswood		Report Results to: Simon Hay		Mobile: 0424 703 009		Email: simon.hay@coffey.com																	
		Invoices to: Simon Hay		Phone: 0427 643 063		Email: luke.steller@coffey.com																			
Project No: SYDGE214942		Task No:		Analysis Request Section																					
Project Name: Mann St Gosford		Laboratory: Eurofins																							
Sampler's Name: Lily		Project Manager: Simon Hay																							
Special Instructions:				NOTES																					
Lab No.	Sample ID	Sample Date	Time							Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	Suite B4 (TRH, BTEX, PAH)	Suite M8 (Metals)	Suite B13 OCP, PCB	pH Fieldscreen pHf, pHfox	SPOCAS	TRH (CG-C10) & BTEX	Asbestos (40g)	Hold					
	BH10-0.3-0.7	#####								Soil	Jar		X	X											
	BH10-1.5-1.7	#####								Soil	Jar									X					
	BH10-1.8-2.0	#####								Soil	Jar									X					
	BH10_0.1-0.3	#####								Soil	Soil									X					
	BH10_0.7-0.9	#####								Soil	Soil									X					
	BH10-2.0-2.3	#####								Soil	Soil					X									
	R3	#####								Water			X	X	X										
	TS4	#####																X							
	TB4	#####																X							
	Dup2																								
	Dup3																								
	Dup4																								
	Trip2																								
	Trip3																								
	Trip4																								
RELINQUISHED BY				RECEIVED BY				Sample Receipt Advice: (Lab Use Only)																	
Name:		Date:		→		Name: <i>Simon Hay</i>		Date: <i>02/03/18</i>		All Samples Recieved in Good Condition ☐ All Documentation is in Proper Order ☐ Samples Received Properly Chilled ☐ Lab. Ref/Batch No. #5875A9															
Coffey Environments		Time:				Company: <i>Eurofins Mgt</i>		Time: <i>5:32 PM</i>																	
Name:		Date:		→		Name:		Date:																	
Company:		Time:				Company:		Time:																	

Sample Receipt Advice

Company name: **Coffey Environments Pty Ltd NSW**

Contact name: Simon Hay
Project name: MANN ST GOSFORD
Project ID: SYDGE214942
COC number: Not provided
Turn around time: 1 Day
Date/Time received: Mar 2, 2018 5:32 PM
Eurofins | mgt reference: **587549**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt
Sample Receipt : 23 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Simon Hay - simon.hay@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Environments Pty Ltd NSW email address.

Certificate of Analysis

Coffey Environments Pty Ltd NSW
Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: **Simon Hay**

Report **587549-S-V2**
 Project name MANN ST GOSFORD
 Project ID SYDGE214942
 Received Date Mar 02, 2018

Client Sample ID			BH10-2.0-2.3
Sample Matrix			Soil
Eurofins mgt Sample No.			S18-Ma02874
Date Sampled			Feb 28, 2018
Test/Reference	LOR	Unit	
Acid Sulfate Soils Field pH Test			
pH-F (Field pH test)*	0.1	pH Units	7.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.9
Reaction Ratings* ^{S05}		comment	4.0

Sample History

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

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

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

Acid Sulfate Soils Field pH Test

Testing Site

Sydney

Extracted

Mar 05, 2018

Holding Time

7 Days

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

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: MANN ST GOSFORD
Project ID: SYDGE214942

Order No.:
Report #: 587549
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Mar 2, 2018 5:32 PM
Due: Mar 5, 2018
Priority: 1 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Acid Sulfate Soils Field pH Test
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						X
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						
External Laboratory						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID	
1	BH10-2.0-2.3	Feb 28, 2018		Soil	S18-Ma02874	X
Test Counts						1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota 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. 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	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCB	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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. 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.

Comments

The report has been revised (V2) to amend sample descriptions

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

Comments

Qualifier Codes/Comments

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

Authorised By

Nibha Vaidya Analytical Services Manager



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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Enviro Sample NSW

From: Nibha Vaidya
Sent: Wednesday, 7 March 2018 11:09 AM
To: Enviro Sample NSW; COC NSW
Subject: 5 DAY TAT - FW: SPOCAS Sample Analysis
Attachments: 28022018 Chain of Custody Form.xlsx

Follow Up Flag: Follow up
Flag Status: Flagged

Additional SPOCAS please – 5 day TAT

As Simon has indicated below, sampling dates are listed on the COC, you just have to make the relevant column on Excel wider. Please add dates to all of the relevant Mann St Gosford reports and let me know once done.

Cheers.

Kind Regards,

Nibha Vaidya
Phone : +61 2 9900 8415
Mobile : +61 499 900 805
Email : NibhaVaidya@eurofins.com

From: Hay, Simon [<mailto:Simon.Hay@coffey.com>]
Sent: Wednesday, 7 March 2018 10:35 AM
To: Asim Khan; Nibha Vaidya
Subject: SPOCAS Sample Analysis

EXTERNAL EMAIL*

Hi Nibha and Asim,

can I schedule the following for SPOCAS testing on a 5 day TAT please:

P1_1.7-2.2 (Eurofins report 587543)
P4_2.0-3.0 (Eurofins report 587547)
BH6_1.6-2.0 (Eurofins report 587713)
P8_2_2.3 (Eurofins Report 587548)

I'm not sure why but on your sample report it states that the sampling dates were not provided for these, I double checked the COC and it does say have dates provided – are you able to update the reports?

Kind Regards,

Simon Hay
Environmental Scientist

Level 20, Tower B - Citadel Tower
799 Pacific Highway Chatswood NSW 2067

t: +61 2 9406 1060
f: +61 2 9406 1002
m: 0424 703 009
w: coffey.com



>>> **Ingenuity@coffey** – it's the ideas that count



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Sample Receipt Advice

Company name: **Coffey Environments Pty Ltd NSW**
Contact name: **Simon Hay**
Project name: **ADDITIONAL - MANN ST GOSFORD**
Project ID: **SYDGE214942**
COC number: **Not provided**
Turn around time: **5 Day**
Date/Time received: **Mar 7, 2018 11:09 AM**
Eurofins | mgt reference: **588183**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt
Sample Receipt : 23 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Simon Hay - simon.hay@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Environments Pty Ltd NSW email address.

Certificate of Analysis

Coffey Environments Pty Ltd NSW
Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Simon Hay

Report 588183-S
Project name ADDITIONAL - MANN ST GOSFORD
Project ID SYDGE214942
Received Date Mar 07, 2018

Client Sample ID			P1_1.7-2.2
Sample Matrix			Soil
Eurofins mgt Sample No.			S18-Ma07364
Date Sampled			Feb 28, 2018
Test/Reference	LOR	Unit	
SPOCAS Suite			
pH-KCL	0.1	pH Units	4.5
pH-OX	0.1	pH Units	4.0
Acid trail - Titratable Actual Acidity	2	mol H+/t	21
Acid trail - Titratable Peroxide Acidity	2	mol H+/t	37
Acid trail - Titratable Sulfidic Acidity	2	mol H+/t	16
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.03
sulfidic - TPA equiv. S% pyrite	0.02	% pyrite S	0.06
sulfidic - TSA equiv. S% pyrite	0.02	% pyrite S	0.03
Sulfur - KCl Extractable	0.02	% S	< 0.02
Sulfur - Peroxide	0.02	% S	< 0.02
Sulfur - Peroxide Oxidisable Sulfur	0.02	% S	< 0.02
acidity - Peroxide Oxidisable Sulfur	10	mol H+/t	< 10
HCl Extractable Sulfur	0.02	% S	n/a
Net Acid soluble sulfur	0.02	% S	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a
Calcium - KCl Extractable	0.02	% Ca	0.03
Calcium - Peroxide	0.02	% Ca	0.03
Acid Reacted Calcium	0.02	% Ca	< 0.02
acidity - Acid Reacted Calcium	10	mol H+/t	< 10
sulfidic - Acid Reacted Ca equiv. S% pyrite	0.02	% S	< 0.02
Magnesium - KCl Extractable	0.02	% Mg	< 0.02
Magnesium - Peroxide	0.02	% Mg	0.02
Acid Reacted Magnesium	0.02	% Mg	0.02
acidity - Acid Reacted Magnesium	10	mol H+/t	17
sulfidic - Acid Reacted Mg equiv. S% pyrite	0.02	% S	0.03
Acid Neutralising Capacity (ANCE)	0.02	%CaCO3	n/a
Acid Neutralising Capacity - Acidity units (a-ANCE)	10	mol H+/t	n/a
Acid Neutralising Capacity - equivalent S% pyrite(s-ANCE)	0.02	% S	n/a
ANC Fineness Factor		factor	1.5
SPOCAS - Net Acidity (Sulfur Units)	0.02	% S	0.03
SPOCAS - Net Acidity (Acidity Units)	10	mol H+/t	21
SPOCAS - Liming rate	1	kg CaCO3/t	2.0

Client Sample ID			P1_1.7-2.2
Sample Matrix			Soil
Eurofins mgt Sample No.			S18-Ma07364
Date Sampled			Feb 28, 2018
Test/Reference	LOR	Unit	
Extraneous Material			
<2mm Fraction	0.005	g	180
>2mm Fraction	0.005	g	1.0
Analysed Material	0.1	%	99
Extraneous Material	0.1	%	0.6
% Moisture	1	%	16

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 (regarding both quality and NATA accreditation).

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			
SPOCAS Suite	Brisbane	Mar 08, 2018	6 Week
- Method: LTM-GEN-7050			
Extraneous Material	Brisbane	Mar 08, 2018	6 Week
- Method: LTM-GEN-7050/7070			
% Moisture	Brisbane	Mar 07, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: ADDITIONAL - MANN ST GOSFORD
Project ID: SYDGE214942

Order No.:
Report #: 588183
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Mar 7, 2018 11:09 AM
Due: Mar 14, 2018
Priority: 5 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						SPOCAS Suite	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794						X	X
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	P1_1.7-2.2	Feb 28, 2018		Soil	S18-Ma07364	X	X
Test Counts						1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota 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. 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	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NC	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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

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

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
SPOCAS Suite				Result 1	Result 2	RPD			
pH-KCL	S18-Ma07383	NCP	pH Units	4.6	4.6	<1	30%	Pass	
pH-OX	S18-Ma07383	NCP	pH Units	3.9	3.9	<1	30%	Pass	
Acid trail - Titratable Actual Acidity	S18-Ma07383	NCP	mol H+/t	23	23	1.0	30%	Pass	
Acid trail - Titratable Peroxide Acidity	S18-Ma07383	NCP	mol H+/t	30	30	1.0	30%	Pass	
Acid trail - Titratable Sulfidic Acidity	S18-Ma07383	NCP	mol H+/t	7.0	7.0	3.0	30%	Pass	
sulfidic - TAA equiv. S% pyrite	S18-Ma07383	NCP	% pyrite S	0.04	0.04	1.0	30%	Pass	
sulfidic - TPA equiv. S% pyrite	S18-Ma07383	NCP	% pyrite S	0.05	0.05	1.0	30%	Pass	
sulfidic - TSA equiv. S% pyrite	S18-Ma07383	NCP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - KCl Extractable	S18-Ma07383	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - Peroxide	S18-Ma07383	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - Peroxide Oxidisable Sulfur	S18-Ma07383	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
acidity - Peroxide Oxidisable Sulfur	S18-Ma07383	NCP	mol H+/t	< 10	< 10	<1	30%	Pass	
HCl Extractable Sulfur	S18-Ma07383	NCP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur	S18-Ma07383	NCP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - acidity units	S18-Ma07383	NCP	mol H+/t	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	S18-Ma07383	NCP	% S	n/a	n/a	n/a	30%	Pass	
Calcium - KCl Extractable	S18-Ma07383	NCP	% Ca	0.02	0.02	2.0	30%	Pass	
Calcium - Peroxide	S18-Ma07383	NCP	% Ca	0.02	0.02	6.0	30%	Pass	
Acid Reacted Calcium	S18-Ma07383	NCP	% Ca	< 0.02	< 0.02	<1	30%	Pass	
acidity - Acid Reacted Calcium	S18-Ma07383	NCP	mol H+/t	< 10	< 10	<1	30%	Pass	
sulfidic - Acid Reacted Ca equiv. S% pyrite	S18-Ma07383	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Magnesium - KCl Extractable	S18-Ma07383	NCP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
Magnesium - Peroxide	S18-Ma07383	NCP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
Acid Reacted Magnesium	S18-Ma07383	NCP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
acidity - Acid Reacted Magnesium	S18-Ma07383	NCP	mol H+/t	< 10	< 10	<1	30%	Pass	
sulfidic - Acid Reacted Mg equiv. S% pyrite	S18-Ma07383	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Acid Neutralising Capacity (ANCE)	S18-Ma07383	NCP	%CaCO3	n/a	n/a	n/a	30%	Pass	
Acid Neutralising Capacity - Acidity units (a-ANCE)	S18-Ma07383	NCP	mol H+/t	n/a	n/a	n/a	30%	Pass	
ANC Fineness Factor	S18-Ma07383	NCP	factor	1.5	1.5	<1	30%	Pass	
SPOCAS - Liming rate	S18-Ma07383	NCP	kg CaCO3/t	2.0	2.0	1.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	B18-Fe31955	NCP	%	< 1	< 1	<1	30%	Pass	

Comments

Sample Integrity

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

Comments

Qualifier Codes/Comments

Code	Description
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5

Authorised By

Nibha Vaidya	Analytical Services Manager
Myles Clark	Senior Analyst-Metal (QLD)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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Enviro Sample NSW

From: Nibha Vaidya
Sent: Wednesday, 7 March 2018 11:09 AM
To: Enviro Sample NSW; COC NSW
Subject: 5 DAY TAT - FW: SPOCAS Sample Analysis
Attachments: 28022018 Chain of Custody Form.xlsx

Follow Up Flag: Follow up
Flag Status: Flagged

Additional SPOCAS please – 5 day TAT

As Simon has indicated below, sampling dates are listed on the COC, you just have to make the relevant column on Excel wider. Please add dates to all of the relevant Mann St Gosford reports and let me know once done.

Cheers.

Kind Regards,

Nibha Vaidya
Phone : +61 2 9900 8415
Mobile : +61 499 900 805
Email : NibhaVaidya@eurofins.com

From: Hay, Simon [<mailto:Simon.Hay@coffey.com>]
Sent: Wednesday, 7 March 2018 10:35 AM
To: Asim Khan; Nibha Vaidya
Subject: SPOCAS Sample Analysis

EXTERNAL EMAIL*

Hi Nibha and Asim,

can I schedule the following for SPOCAS testing on a 5 day TAT please:

P1_1.7-2.2 (Eurofins report 587543)
P4_2.0-3.0 (Eurofins report 587547)
BH6_1.6-2.0 (Eurofins report 587713)
P8_2_2.3 (Eurofins Report 587548)

I'm not sure why but on your sample report it states that the sampling dates were not provided for these, I double checked the COC and it does say have dates provided – are you able to update the reports?

Kind Regards,

Simon Hay
Environmental Scientist

Level 20, Tower B - Citadel Tower
799 Pacific Highway Chatswood NSW 2067

t: +61 2 9406 1060
f: +61 2 9406 1002
m: 0424 703 009
w: coffey.com



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Sample Receipt Advice

Company name: **Coffey Environments Pty Ltd NSW**
Contact name: **Simon Hay**
Project name: **ADDITIONAL - MANN ST GOSFORD**
Project ID: **SYDGE214942**
COC number: **Not provided**
Turn around time: **5 Day**
Date/Time received: **Mar 7, 2018 11:09 AM**
Eurofins | mgt reference: **588191**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 23 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Simon Hay - simon.hay@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Environments Pty Ltd NSW email address.

Certificate of Analysis

Coffey Environments Pty Ltd NSW
Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Simon Hay

Report 588191-S
Project name ADDITIONAL - MANN ST GOSFORD
Project ID SYDGE214942
Received Date Mar 07, 2018

Client Sample ID			P4-2.0-3.0
Sample Matrix			Soil
Eurofins mgt Sample No.			S18-Ma07382
Date Sampled			Feb 27, 2018
Test/Reference	LOR	Unit	
SPOCAS Suite			
pH-KCL	0.1	pH Units	4.1
pH-OX	0.1	pH Units	4.5
Acid trail - Titratable Actual Acidity	2	mol H+/t	45
Acid trail - Titratable Peroxide Acidity	2	mol H+/t	58
Acid trail - Titratable Sulfidic Acidity	2	mol H+/t	13
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.07
sulfidic - TPA equiv. S% pyrite	0.02	% pyrite S	0.09
sulfidic - TSA equiv. S% pyrite	0.02	% pyrite S	0.02
Sulfur - KCl Extractable	0.02	% S	< 0.02
Sulfur - Peroxide	0.02	% S	< 0.02
Sulfur - Peroxide Oxidisable Sulfur	0.02	% S	< 0.02
acidity - Peroxide Oxidisable Sulfur	10	mol H+/t	< 10
HCl Extractable Sulfur	0.02	% S	< 0.02
Net Acid soluble sulfur	0.02	% S	< 0.02
Net Acid soluble sulfur - acidity units	10	mol H+/t	< 10
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	< 0.02
Calcium - KCl Extractable	0.02	% Ca	< 0.02
Calcium - Peroxide	0.02	% Ca	< 0.02
Acid Reacted Calcium	0.02	% Ca	< 0.02
acidity - Acid Reacted Calcium	10	mol H+/t	< 10
sulfidic - Acid Reacted Ca equiv. S% pyrite	0.02	% S	< 0.02
Magnesium - KCl Extractable	0.02	% Mg	0.03
Magnesium - Peroxide	0.02	% Mg	0.03
Acid Reacted Magnesium	0.02	% Mg	< 0.02
acidity - Acid Reacted Magnesium	10	mol H+/t	< 10
sulfidic - Acid Reacted Mg equiv. S% pyrite	0.02	% S	< 0.02
Acid Neutralising Capacity (ANCE)	0.02	%CaCO3	n/a
Acid Neutralising Capacity - Acidity units (a-ANCE)	10	mol H+/t	n/a
Acid Neutralising Capacity - equivalent S% pyrite(s-ANCE)	0.02	% S	n/a
ANC Fineness Factor		factor	1.5
SPOCAS - Net Acidity (Sulfur Units)	0.02	% S	0.07
SPOCAS - Net Acidity (Acidity Units)	10	mol H+/t	45
SPOCAS - Liming rate	1	kg CaCO3/t	3.0

Client Sample ID			P4-2.0-3.0
Sample Matrix			Soil
Eurofins mgt Sample No.			S18-Ma07382
Date Sampled			Feb 27, 2018
Test/Reference	LOR	Unit	
Extraneous Material			
<2mm Fraction	0.005	g	180
>2mm Fraction	0.005	g	0.55
Analysed Material	0.1	%	100
Extraneous Material	0.1	%	0.3
% Moisture	1	%	23

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 (regarding both quality and NATA accreditation).

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			
SPOCAS Suite	Brisbane	Mar 08, 2018	6 Week
- Method: LTM-GEN-7050			
Extraneous Material	Brisbane	Mar 08, 2018	6 Week
- Method: LTM-GEN-7050/7070			
% Moisture	Brisbane	Mar 07, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: ADDITIONAL - MANN ST GOSFORD
Project ID: SYDGE214942

Order No.:
Report #: 588191
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Mar 7, 2018 11:09 AM
Due: Mar 14, 2018
Priority: 5 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						SPOCAS Suite	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794						X	X
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	P4-2.0-3.0	Feb 27, 2018		Soil	S18-Ma07382	X	X
Test Counts						1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota 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. 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	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NC	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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

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

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
SPOCAS Suite				Result 1	Result 2	RPD			
pH-KCL	S18-Ma07383	NCP	pH Units	4.6	4.6	<1	30%	Pass	
pH-OX	S18-Ma07383	NCP	pH Units	3.9	3.9	<1	30%	Pass	
Acid trail - Titratable Actual Acidity	S18-Ma07383	NCP	mol H+/t	23	23	1.0	30%	Pass	
Acid trail - Titratable Peroxide Acidity	S18-Ma07383	NCP	mol H+/t	30	30	1.0	30%	Pass	
Acid trail - Titratable Sulfidic Acidity	S18-Ma07383	NCP	mol H+/t	7.0	7.0	3.0	30%	Pass	
sulfidic - TAA equiv. S% pyrite	S18-Ma07383	NCP	% pyrite S	0.04	0.04	1.0	30%	Pass	
sulfidic - TPA equiv. S% pyrite	S18-Ma07383	NCP	% pyrite S	0.05	0.05	1.0	30%	Pass	
sulfidic - TSA equiv. S% pyrite	S18-Ma07383	NCP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - KCl Extractable	S18-Ma07383	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - Peroxide	S18-Ma07383	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - Peroxide Oxidisable Sulfur	S18-Ma07383	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
acidity - Peroxide Oxidisable Sulfur	S18-Ma07383	NCP	mol H+/t	< 10	< 10	<1	30%	Pass	
HCl Extractable Sulfur	S18-Ma07383	NCP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur	S18-Ma07383	NCP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - acidity units	S18-Ma07383	NCP	mol H+/t	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	S18-Ma07383	NCP	% S	n/a	n/a	n/a	30%	Pass	
Calcium - KCl Extractable	S18-Ma07383	NCP	% Ca	0.02	0.02	2.0	30%	Pass	
Calcium - Peroxide	S18-Ma07383	NCP	% Ca	0.02	0.02	6.0	30%	Pass	
Acid Reacted Calcium	S18-Ma07383	NCP	% Ca	< 0.02	< 0.02	<1	30%	Pass	
acidity - Acid Reacted Calcium	S18-Ma07383	NCP	mol H+/t	< 10	< 10	<1	30%	Pass	
sulfidic - Acid Reacted Ca equiv. S% pyrite	S18-Ma07383	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Magnesium - KCl Extractable	S18-Ma07383	NCP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
Magnesium - Peroxide	S18-Ma07383	NCP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
Acid Reacted Magnesium	S18-Ma07383	NCP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
acidity - Acid Reacted Magnesium	S18-Ma07383	NCP	mol H+/t	< 10	< 10	<1	30%	Pass	
sulfidic - Acid Reacted Mg equiv. S% pyrite	S18-Ma07383	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Acid Neutralising Capacity (ANCE)	S18-Ma07383	NCP	%CaCO3	n/a	n/a	n/a	30%	Pass	
Acid Neutralising Capacity - Acidity units (a-ANCE)	S18-Ma07383	NCP	mol H+/t	n/a	n/a	n/a	30%	Pass	
ANC Fineness Factor	S18-Ma07383	NCP	factor	1.5	1.5	<1	30%	Pass	
SPOCAS - Liming rate	S18-Ma07383	NCP	kg CaCO3/t	2.0	2.0	1.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	B17-De10235	NCP	%	2.1	2.0	8.0	30%	Pass	

Comments

Sample Integrity

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

Comments

Qualifier Codes/Comments

Code	Description
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5

Authorised By

Nibha Vaidya	Analytical Services Manager
Myles Clark	Senior Analyst-Metal (QLD)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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Enviro Sample NSW

From: Nibha Vaidya
Sent: Wednesday, 7 March 2018 11:09 AM
To: Enviro Sample NSW; COC NSW
Subject: 5 DAY TAT - FW: SPOCAS Sample Analysis
Attachments: 28022018 Chain of Custody Form.xlsx

Follow Up Flag: Follow up
Flag Status: Flagged

Additional SPOCAS please – 5 day TAT

As Simon has indicated below, sampling dates are listed on the COC, you just have to make the relevant column on Excel wider. Please add dates to all of the relevant Mann St Gosford reports and let me know once done.

Cheers.

Kind Regards,

Nibha Vaidya
Phone : +61 2 9900 8415
Mobile : +61 499 900 805
Email : NibhaVaidya@eurofins.com

From: Hay, Simon [<mailto:Simon.Hay@coffey.com>]
Sent: Wednesday, 7 March 2018 10:35 AM
To: Asim Khan; Nibha Vaidya
Subject: SPOCAS Sample Analysis

EXTERNAL EMAIL*

Hi Nibha and Asim,

can I schedule the following for SPOCAS testing on a 5 day TAT please:

P1_1.7-2.2 (Eurofins report 587543)
P4_2.0-3.0 (Eurofins report 587547)
BH6_1.6-2.0 (Eurofins report 587713)
P8_2_2.3 (Eurofins Report 587548)

I'm not sure why but on your sample report it states that the sampling dates were not provided for these, I double checked the COC and it does say have dates provided – are you able to update the reports?

Kind Regards,

Simon Hay
Environmental Scientist

Level 20, Tower B - Citadel Tower
799 Pacific Highway Chatswood NSW 2067

t: +61 2 9406 1060
f: +61 2 9406 1002
m: 0424 703 009
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Sample Receipt Advice

Company name: **Coffey Environments Pty Ltd NSW**
Contact name: **Simon Hay**
Project name: **ADDITIONAL - MANN ST GOSFORD**
Project ID: **SYDGE214942**
COC number: **Not provided**
Turn around time: **5 Day**
Date/Time received: **Mar 7, 2018 11:09 AM**
Eurofins | mgt reference: **588192**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt
Sample Receipt : 23.1 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Simon Hay - simon.hay@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Environments Pty Ltd NSW email address.

Certificate of Analysis

Coffey Environments Pty Ltd NSW
Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Simon Hay

Report 588192-S
Project name ADDITIONAL - MANN ST GOSFORD
Project ID SYDGE214942
Received Date Mar 07, 2018

Client Sample ID			BH6 (1.6-2.0M)
Sample Matrix			Soil
Eurofins mgt Sample No.			S18-Ma07383
Date Sampled			Mar 01, 2018
Test/Reference	LOR	Unit	
SPOCAS Suite			
pH-KCL	0.1	pH Units	4.6
pH-OX	0.1	pH Units	3.9
Acid trail - Titratable Actual Acidity	2	mol H+/t	23
Acid trail - Titratable Peroxide Acidity	2	mol H+/t	30
Acid trail - Titratable Sulfidic Acidity	2	mol H+/t	7.0
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	0.04
sulfidic - TPA equiv. S% pyrite	0.02	% pyrite S	0.05
sulfidic - TSA equiv. S% pyrite	0.02	% pyrite S	< 0.02
Sulfur - KCl Extractable	0.02	% S	< 0.02
Sulfur - Peroxide	0.02	% S	< 0.02
Sulfur - Peroxide Oxidisable Sulfur	0.02	% S	< 0.02
acidity - Peroxide Oxidisable Sulfur	10	mol H+/t	< 10
HCl Extractable Sulfur	0.02	% S	n/a
Net Acid soluble sulfur	0.02	% S	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a
Calcium - KCl Extractable	0.02	% Ca	0.02
Calcium - Peroxide	0.02	% Ca	0.02
Acid Reacted Calcium	0.02	% Ca	< 0.02
acidity - Acid Reacted Calcium	10	mol H+/t	< 10
sulfidic - Acid Reacted Ca equiv. S% pyrite	0.02	% S	< 0.02
Magnesium - KCl Extractable	0.02	% Mg	< 0.02
Magnesium - Peroxide	0.02	% Mg	< 0.02
Acid Reacted Magnesium	0.02	% Mg	< 0.02
acidity - Acid Reacted Magnesium	10	mol H+/t	< 10
sulfidic - Acid Reacted Mg equiv. S% pyrite	0.02	% S	< 0.02
Acid Neutralising Capacity (ANCE)	0.02	%CaCO3	n/a
Acid Neutralising Capacity - Acidity units (a-ANCE)	10	mol H+/t	n/a
Acid Neutralising Capacity - equivalent S% pyrite(s-ANCE)	0.02	% S	n/a
ANC Fineness Factor		factor	1.5
SPOCAS - Net Acidity (Sulfur Units)	0.02	% S	0.04
SPOCAS - Net Acidity (Acidity Units)	10	mol H+/t	23
SPOCAS - Liming rate	1	kg CaCO3/t	2.0

Client Sample ID			BH6 (1.6-2.0M)
Sample Matrix			Soil
Eurofins mgt Sample No.			S18-Ma07383
Date Sampled			Mar 01, 2018
Test/Reference	LOR	Unit	
Extraneous Material			
<2mm Fraction	0.005	g	86
>2mm Fraction	0.005	g	< 0.005
Analysed Material	0.1	%	100
Extraneous Material	0.1	%	< 0.1
% Moisture	1	%	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 (regarding both quality and NATA accreditation).

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			
SPOCAS Suite	Brisbane	Mar 08, 2018	6 Week
- Method: LTM-GEN-7050			
Extraneous Material	Brisbane	Mar 08, 2018	6 Week
- Method: LTM-GEN-7050/7070			
% Moisture	Brisbane	Mar 07, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: ADDITIONAL - MANN ST GOSFORD
Project ID: SYDGE214942

Order No.:
Report #: 588192
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Mar 7, 2018 11:09 AM
Due: Mar 14, 2018
Priority: 5 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						SPOCAS Suite	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794						X	X
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	BH6 (1.6-2.0M)	Mar 01, 2018		Soil	S18-Ma07383	X	X
Test Counts						1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota 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. 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	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NC	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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

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

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
SPOCAS Suite				Result 1	Result 2	RPD			
pH-KCL	S18-Ma07383	CP	pH Units	4.6	4.6	<1	30%	Pass	
pH-OX	S18-Ma07383	CP	pH Units	3.9	3.9	<1	30%	Pass	
Acid trail - Titratable Actual Acidity	S18-Ma07383	CP	mol H+/t	23	23	1.0	30%	Pass	
Acid trail - Titratable Peroxide Acidity	S18-Ma07383	CP	mol H+/t	30	30	1.0	30%	Pass	
Acid trail - Titratable Sulfidic Acidity	S18-Ma07383	CP	mol H+/t	7.0	7.0	3.0	30%	Pass	
sulfidic - TAA equiv. S% pyrite	S18-Ma07383	CP	% pyrite S	0.04	0.04	1.0	30%	Pass	
sulfidic - TPA equiv. S% pyrite	S18-Ma07383	CP	% pyrite S	0.05	0.05	1.0	30%	Pass	
sulfidic - TSA equiv. S% pyrite	S18-Ma07383	CP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - KCl Extractable	S18-Ma07383	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - Peroxide	S18-Ma07383	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - Peroxide Oxidisable Sulfur	S18-Ma07383	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
acidity - Peroxide Oxidisable Sulfur	S18-Ma07383	CP	mol H+/t	< 10	< 10	<1	30%	Pass	
HCl Extractable Sulfur	S18-Ma07383	CP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur	S18-Ma07383	CP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - acidity units	S18-Ma07383	CP	mol H+/t	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	S18-Ma07383	CP	% S	n/a	n/a	n/a	30%	Pass	
Calcium - KCl Extractable	S18-Ma07383	CP	% Ca	0.02	0.02	2.0	30%	Pass	
Calcium - Peroxide	S18-Ma07383	CP	% Ca	0.02	0.02	6.0	30%	Pass	
Acid Reacted Calcium	S18-Ma07383	CP	% Ca	< 0.02	< 0.02	<1	30%	Pass	
acidity - Acid Reacted Calcium	S18-Ma07383	CP	mol H+/t	< 10	< 10	<1	30%	Pass	
sulfidic - Acid Reacted Ca equiv. S% pyrite	S18-Ma07383	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
Magnesium - KCl Extractable	S18-Ma07383	CP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
Magnesium - Peroxide	S18-Ma07383	CP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
Acid Reacted Magnesium	S18-Ma07383	CP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
acidity - Acid Reacted Magnesium	S18-Ma07383	CP	mol H+/t	< 10	< 10	<1	30%	Pass	
sulfidic - Acid Reacted Mg equiv. S% pyrite	S18-Ma07383	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
Acid Neutralising Capacity (ANCE)	S18-Ma07383	CP	%CaCO3	n/a	n/a	n/a	30%	Pass	
Acid Neutralising Capacity - Acidity units (a-ANCE)	S18-Ma07383	CP	mol H+/t	n/a	n/a	n/a	30%	Pass	
ANC Fineness Factor	S18-Ma07383	CP	factor	1.5	1.5	<1	30%	Pass	
SPOCAS - Liming rate	S18-Ma07383	CP	kg CaCO3/t	2.0	2.0	1.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S18-Ma07383	CP	%	15	14	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	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Comments

Qualifier Codes/Comments

Code	Description
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5

Authorised By

Nibha Vaidya	Analytical Services Manager
Myles Clark	Senior Analyst-Metal (QLD)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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Enviro Sample NSW

From: Nibha Vaidya
Sent: Wednesday, 7 March 2018 11:09 AM
To: Enviro Sample NSW; COC NSW
Subject: 5 DAY TAT - FW: SPOCAS Sample Analysis
Attachments: 28022018 Chain of Custody Form.xlsx

Follow Up Flag: Follow up
Flag Status: Flagged

Additional SPOCAS please – 5 day TAT

As Simon has indicated below, sampling dates are listed on the COC, you just have to make the relevant column on Excel wider. Please add dates to all of the relevant Mann St Gosford reports and let me know once done.

Cheers.

Kind Regards,

Nibha Vaidya
Phone : +61 2 9900 8415
Mobile : +61 499 900 805
Email : NibhaVaidya@eurofins.com

From: Hay, Simon [<mailto:Simon.Hay@coffey.com>]
Sent: Wednesday, 7 March 2018 10:35 AM
To: Asim Khan; Nibha Vaidya
Subject: SPOCAS Sample Analysis

EXTERNAL EMAIL*

Hi Nibha and Asim,

can I schedule the following for SPOCAS testing on a 5 day TAT please:

P1_1.7-2.2 (Eurofins report 587543)
P4_2.0-3.0 (Eurofins report 587547)
BH6_1.6-2.0 (Eurofins report 587713)
P8_2_2.3 (Eurofins Report 587548)

I'm not sure why but on your sample report it states that the sampling dates were not provided for these, I double checked the COC and it does say have dates provided – are you able to update the reports?

Kind Regards,

Simon Hay
Environmental Scientist

Level 20, Tower B - Citadel Tower
799 Pacific Highway Chatswood NSW 2067

t: +61 2 9406 1060
f: +61 2 9406 1002
m: 0424 703 009
w: coffey.com



>>> **Ingenuity@coffey** – it's the ideas that count



Click [here](#) to report this email as spam.

ScannedByWebsenseForEurofins

* WARNING - EXTERNAL: This email originated from outside of Eurofins. Do not click any links or open any attachments unless you trust the sender and know that the content is safe!

Certificate of Analysis

Coffey Environments Pty Ltd NSW
Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Simon Hay

Report 588193-S
Project name ADDITIONAL - MANN ST GOSFORD
Project ID SYDGE214942
Received Date Mar 07, 2018

Client Sample ID			P8_2-2.3
Sample Matrix			Soil
Eurofins mgt Sample No.			S18-Ma07384
Date Sampled			Feb 28, 2018
Test/Reference	LOR	Unit	
SPOCAS Suite			
pH-KCL	0.1	pH Units	11
pH-OX	0.1	pH Units	8.6
Acid trail - Titratable Actual Acidity	2	mol H+/t	< 2
Acid trail - Titratable Peroxide Acidity	2	mol H+/t	< 2
Acid trail - Titratable Sulfidic Acidity	2	mol H+/t	< 2
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	< 0.02
sulfidic - TPA equiv. S% pyrite	0.02	% pyrite S	< 0.02
sulfidic - TSA equiv. S% pyrite	0.02	% pyrite S	< 0.02
Sulfur - KCl Extractable	0.02	% S	< 0.02
Sulfur - Peroxide	0.02	% S	0.02
Sulfur - Peroxide Oxidisable Sulfur	0.02	% S	0.02
acidity - Peroxide Oxidisable Sulfur	10	mol H+/t	14
HCl Extractable Sulfur	0.02	% S	n/a
Net Acid soluble sulfur	0.02	% S	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a
Calcium - KCl Extractable	0.02	% Ca	0.26
Calcium - Peroxide	0.02	% Ca	0.75
Acid Reacted Calcium	0.02	% Ca	0.49
acidity - Acid Reacted Calcium	10	mol H+/t	240
sulfidic - Acid Reacted Ca equiv. S% pyrite	0.02	% S	0.39
Magnesium - KCl Extractable	0.02	% Mg	< 0.02
Magnesium - Peroxide	0.02	% Mg	< 0.02
Acid Reacted Magnesium	0.02	% Mg	< 0.02
acidity - Acid Reacted Magnesium	10	mol H+/t	< 10
sulfidic - Acid Reacted Mg equiv. S% pyrite	0.02	% S	< 0.02
Acid Neutralising Capacity (ANCE)	0.02	%CaCO3	1.7
Acid Neutralising Capacity - Acidity units (a-ANCE)	10	mol H+/t	340
Acid Neutralising Capacity - equivalent S% pyrite(s-ANCE)	0.02	% S	0.54
ANC Fineness Factor		factor	1.5
SPOCAS - Net Acidity (Sulfur Units)	0.02	% S	< 0.02
SPOCAS - Net Acidity (Acidity Units)	10	mol H+/t	< 10
SPOCAS - Liming rate	1	kg CaCO3/t	< 1

Client Sample ID			P8_2-2.3
Sample Matrix			Soil
Eurofins mgt Sample No.			S18-Ma07384
Date Sampled			Feb 28, 2018
Test/Reference	LOR	Unit	
Extraneous Material			
<2mm Fraction	0.005	g	75
>2mm Fraction	0.005	g	64
Analysed Material	0.1	%	54
Extraneous Material	0.1	%	46
% Moisture	1	%	6.9

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 (regarding both quality and NATA accreditation).

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			
SPOCAS Suite	Brisbane	Mar 08, 2018	6 Week
- Method: LTM-GEN-7050			
Extraneous Material	Brisbane	Mar 08, 2018	6 Week
- Method: LTM-GEN-7050/7070			
% Moisture	Brisbane	Mar 07, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: ADDITIONAL - MANN ST GOSFORD
Project ID: SYDGE214942

Order No.:
Report #: 588193
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Mar 7, 2018 11:09 AM
Due: Mar 14, 2018
Priority: 5 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						SPOCAS Suite	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794						X	X
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	P8_2-2.3	Feb 28, 2018		Soil	S18-Ma07384	X	X
Test Counts						1	1

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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. This report replaces any interim results previously issued.

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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

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

Terms

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

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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

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

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
SPOCAS Suite				Result 1	Result 2	RPD			
pH-KCL	S18-Ma07383	NCP	pH Units	4.6	4.6	<1	30%	Pass	
pH-OX	S18-Ma07383	NCP	pH Units	3.9	3.9	<1	30%	Pass	
Acid trail - Titratable Actual Acidity	S18-Ma07383	NCP	mol H+/t	23	23	1.0	30%	Pass	
Acid trail - Titratable Peroxide Acidity	S18-Ma07383	NCP	mol H+/t	30	30	1.0	30%	Pass	
Acid trail - Titratable Sulfidic Acidity	S18-Ma07383	NCP	mol H+/t	7.0	7.0	3.0	30%	Pass	
sulfidic - TAA equiv. S% pyrite	S18-Ma07383	NCP	% pyrite S	0.04	0.04	1.0	30%	Pass	
sulfidic - TPA equiv. S% pyrite	S18-Ma07383	NCP	% pyrite S	0.05	0.05	1.0	30%	Pass	
sulfidic - TSA equiv. S% pyrite	S18-Ma07383	NCP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - KCl Extractable	S18-Ma07383	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - Peroxide	S18-Ma07383	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - Peroxide Oxidisable Sulfur	S18-Ma07383	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
acidity - Peroxide Oxidisable Sulfur	S18-Ma07383	NCP	mol H+/t	< 10	< 10	<1	30%	Pass	
HCl Extractable Sulfur	S18-Ma07383	NCP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur	S18-Ma07383	NCP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - acidity units	S18-Ma07383	NCP	mol H+/t	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	S18-Ma07383	NCP	% S	n/a	n/a	n/a	30%	Pass	
Calcium - KCl Extractable	S18-Ma07383	NCP	% Ca	0.02	0.02	2.0	30%	Pass	
Calcium - Peroxide	S18-Ma07383	NCP	% Ca	0.02	0.02	6.0	30%	Pass	
Acid Reacted Calcium	S18-Ma07383	NCP	% Ca	< 0.02	< 0.02	<1	30%	Pass	
acidity - Acid Reacted Calcium	S18-Ma07383	NCP	mol H+/t	< 10	< 10	<1	30%	Pass	
sulfidic - Acid Reacted Ca equiv. S% pyrite	S18-Ma07383	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Magnesium - KCl Extractable	S18-Ma07383	NCP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
Magnesium - Peroxide	S18-Ma07383	NCP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
Acid Reacted Magnesium	S18-Ma07383	NCP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
acidity - Acid Reacted Magnesium	S18-Ma07383	NCP	mol H+/t	< 10	< 10	<1	30%	Pass	
sulfidic - Acid Reacted Mg equiv. S% pyrite	S18-Ma07383	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Acid Neutralising Capacity (ANCE)	S18-Ma07383	NCP	%CaCO3	n/a	n/a	n/a	30%	Pass	
Acid Neutralising Capacity - Acidity units (a-ANCE)	S18-Ma07383	NCP	mol H+/t	n/a	n/a	n/a	30%	Pass	
ANC Fineness Factor	S18-Ma07383	NCP	factor	1.5	1.5	<1	30%	Pass	
SPOCAS - Liming rate	S18-Ma07383	NCP	kg CaCO3/t	2.0	2.0	1.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	B18-Fe05007	NCP	%	18	17	8.0	30%	Pass	

Comments

Sample Integrity

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

Comments

Qualifier Codes/Comments

Code	Description
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5

Authorised By

Nibha Vaidya	Analytical Services Manager
Myles Clark	Senior Analyst-Metal (QLD)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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Issue Date: 23/08/2012

[illegible]

coffey environments SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE		Consigning Office: Chatswood		Report Results to: Simon Hay		Mobile: 0424 703 009		Email: simon.hay@coffey.com											
		Invoices to: Simon Hay		Phone: 0427 643 063		Email: luke.steller@coffey.com													
Project No: SYDGE214942 Task No:				Analysis Request Section															
Project Name: Mann St Gosford Laboratory: Eurofins				NOTES															
Sampler's Name: Lily Project Manager: Simon Hay																			
Special Instructions:																			
Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	Suite B4 (TRH, BTEX, PAH)	Suite M8 (Metals)	Suite B13 OCP, PCB	pH Fieldscreen pHf, pHfox	SPOCAS	TRH (C6-C10) & BTEX	Asbestos (40g)	Hold					
	P4_0.2-0.5	27/02/2018		soil	jar		X	X											
	P4-0.8-1.8	27/02/2018		soil	jar									X					
	P4-1.8_2	27/02/2018		soil	jar									X					
	P4-2.0-3.0	27/02/2018		soil	jar									X					
	P4-0.2-0.5	27/02/2018		soil	bag									X					
	P4-0.8-1.8	27/02/2018		soil	bag					X									
	P4-1.8-2.0	27/02/2018		soil	bag					X									
	P4-2.0-3.0	27/02/2018		soil	bag					X									
	P5-0.7-0.9	28/02/2018		soil	Jar		X	X											
	P5-1.0-1.2	28/02/2018		soil	Jar									X					
	P5-1.4-1.6	28/02/2018		soil	Jar									X					
	P5-0.1-0.3	28/02/2018		soil	Bag									X					
	P5-1.6-1.8	28/02/2018		soil	Bag									X					
	P5-2-2.2	28/02/2018		soil	Bag					X									
RELINQUISHED BY				RECEIVED BY				Sample Receipt Advice: (Lab Use Only)											
Name:		Date:		→ Name: <i>Thong Eukomgt</i>		Date: <i>2/3</i>		All Samples Received in Good Condition ☒											
Coffey Environments		Time:		Company:		Time: <i>5-22pm</i>		All Documentation is in Proper Order ☒											
Name:		Date:		→ Name:		Date:		Samples Received Properly Chilled ☒											
Company:		Time:		Company:		Time:		Lab. Ref/Batch No.											
*Container Type & Preservation Codes: P - Plastic, G- Glass Bottle, J - Glass Jar, V- Vial, Z - Ziplock bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative																			

Issue Date: 23/08/2012

environments SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE		Consigning Office: Chatswood			
		Report Results to: Simon Hay	Mobile: 0424 703 009	Email: simon.hay@coffey.com	
		Invoices to: Simon Hay	Phone: 0427 643 063	Email: luke.steller@coffey.com	

Project No: SYDGE214942		Task No:	
Project Name: Mann St Gosford		Laboratory: Eurofins	
Sampler's Name: Lily		Project Manager: Simon Hay	
Special Instructions:			

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	Analysis Request Section												NOTES
							Suite 84 (TRH, BTEX, PAH)	Suite MB (Metals)	Suite B13 OCP, PCB	pH Fieldscreen pHf, pHfox	SPOCAS	TRH (C6-C10) & BTEX	Asbestos (40g)	Hold					
	BH10-0.3-0.7	28/02/2018		Soil	Jar		X	X											
	BH10-1.5-1.7	28/02/2018		Soil	Jar										X				
	BH10-1.8-2.0	28/02/2018		Soil	Jar										X				
	BH10_0.1-0.3	28/02/2018		Soil	Soil										X				
	BH10_0.7-0.9	28/02/2018		Soil	Soil										X				
	BH10-2.0-2.3	28/02/2018		Soil	Soil							X							
	R3	28/02/2018		Water			X	X	X										
	TS4	28/02/2018									X								
	TB4	28/02/2018									X								
	Dup2																		
	Dup3																		
	Dup4																		
	Trip2																		
	Trip3																		
	Trip4																		

RELINQUISHED BY		RECEIVED BY		Sample Receipt Advice: (Lab Use Only)	
Name:	Date:	→ Name:	Date:	All Samples Recieved in Good Condition	☒
Coffey Environments	Time:	Company: <i>Eurofins</i>	Time: <i>2/3 5:22pm</i>	All Documentation is in Proper Order	☒
Name:	Date:	→ Name:	Date:	Samples Received Properly Chilled	☐
Company:	Time:	Company:	Time:	Lab. Ref/Batch No.	

*Container Type & Preservation Codes: P - Plastic, G- Glass Bottle, J - Glass Jar, V- Vial, Z - Ziplock bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative

Sample Receipt Advice

Company name: **Coffey Environments Pty Ltd NSW**

Contact name: Simon Hay
Project name: MANN ST GOSFORD
Project ID: SYDGE214942
COC number: Not provided
Turn around time: 1 Day
Date/Time received: Mar 14, 2018
Eurofins | mgt reference: **589200**

Sample information

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

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Simon Hay - simon.hay@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Environments Pty Ltd NSW email address.

Certificate of Analysis

Coffey Environments Pty Ltd NSW
Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Simon Hay

Report 589200-S
Project name MANN ST GOSFORD
Project ID SYDGE214942
Received Date Mar 14, 2018

Client Sample ID			BH5_0.2-0.5	BH5_0.6-0.9	P1_0.3-0.5	P2_0.7-0.8
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Ma15237	S18-Ma15238	S18-Ma15239	S18-Ma15240
Date Sampled			Feb 28, 2018	Feb 28, 2018	Feb 28, 2018	Feb 27, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	240	170	170	< 100
TRH >C34-C40	100	mg/kg	320	210	200	< 100
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	92	63	71	< 50
TRH C29-C36	50	mg/kg	270	180	180	62
TRH C10-36 (Total)	50	mg/kg	362	243	251	62
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	108	107	101	98
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			BH5_0.2-0.5	BH5_0.6-0.9	P1_0.3-0.5	P2_0.7-0.8
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Ma15237	S18-Ma15238	S18-Ma15239	S18-Ma15240
Date Sampled			Feb 28, 2018	Feb 28, 2018	Feb 28, 2018	Feb 27, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	101	102	104	99
p-Terphenyl-d14 (surr.)	1	%	105	129	142	INT
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	0.2	mg/kg	-	-	< 0.2	-
Toxaphene	1	mg/kg	-	-	< 1	-
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	-
Dibutylchloroendate (surr.)	1	%	-	-	84	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	100	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1221	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1232	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1242	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1248	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1254	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1260	0.5	mg/kg	-	-	< 0.5	-
Total PCB*	0.5	mg/kg	-	-	< 0.5	-
Dibutylchloroendate (surr.)	1	%	-	-	84	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	100	-

Client Sample ID			BH5_0.2-0.5	BH5_0.6-0.9	P1_0.3-0.5	P2_0.7-0.8
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Ma15237	S18-Ma15238	S18-Ma15239	S18-Ma15240
Date Sampled			Feb 28, 2018	Feb 28, 2018	Feb 28, 2018	Feb 27, 2018
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	5.7	5.1	5.1	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	25	13	23	7.9
Copper	5	mg/kg	21	32	21	< 5
Lead	5	mg/kg	56	15	35	6.0
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	37	25	32	< 5
Zinc	5	mg/kg	92	100	51	< 5
% Moisture	1	%	3.8	6.5	12	9.0

Client Sample ID			P3_0.2-0.5	P4_0.2-0.5	P5_0.7-0.9	P6_0.2-0.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Ma15241	S18-Ma15242	S18-Ma15243	S18-Ma15244
Date Sampled			Feb 27, 2018	Feb 27, 2018	Feb 28, 2018	Feb 28, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	79
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	79
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	95	88	91	93
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID Sample Matrix Eurofins mgt Sample No. Date Sampled Test/Reference	LOR	Unit	P3_0.2-0.5 Soil S18-Ma15241 Feb 27, 2018	P4_0.2-0.5 Soil S18-Ma15242 Feb 27, 2018	P5_0.7-0.9 Soil S18-Ma15243 Feb 28, 2018	P6_0.2-0.6 Soil S18-Ma15244 Feb 28, 2018
Polycyclic Aromatic Hydrocarbons						
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 1	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 1	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 1	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	97	105	99	104
p-Terphenyl-d14 (surr.)	1	%	INT	INT	INT	INT
Heavy Metals						
Arsenic	2	mg/kg	< 2	3.2	< 2	4.0
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	< 5	9.2	6.2	9.7
Copper	5	mg/kg	< 5	9.1	< 5	10
Lead	5	mg/kg	< 5	20	8.1	24
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	8.9	< 5	6.1
Zinc	5	mg/kg	19	37	9.9	40
% Moisture	1	%	10	11	21	8.5

Client Sample ID Sample Matrix Eurofins mgt Sample No. Date Sampled Test/Reference	LOR	Unit	P6_0.6-0.9 Soil S18-Ma15245 Feb 28, 2018	P7_1.1-1.3 Soil S18-Ma15246 Feb 28, 2018	P8_0.6-0.9 Soil S18-Ma15247 Feb 28, 2018	BH10_0.3-0.7 Soil S18-Ma15248 Feb 28, 2018
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	65
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	65

Client Sample ID			P6_0.6-0.9	P7_1.1-1.3	P8_0.6-0.9	BH10_0.3-0.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Ma15245	S18-Ma15246	S18-Ma15247	S18-Ma15248
Date Sampled			Feb 28, 2018	Feb 28, 2018	Feb 28, 2018	Feb 28, 2018
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	84	92	79	92
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	103	105	99	101
p-Terphenyl-d14 (surr.)	1	%	INT	INT	INT	INT
Heavy Metals						
Arsenic	2	mg/kg	< 2	6.3	4.4	2.4
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	26	18	12	12
Copper	5	mg/kg	5.8	7.0	5.3	12
Lead	5	mg/kg	10	21	14	91
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	6.9	6.8	5.0	13
Zinc	5	mg/kg	15	28	21	150
% Moisture	1	%	9.7	15	23	5.4

Client Sample ID			^{R20} TS4	TB4
Sample Matrix			Soil	Soil
Eurofins mgt Sample No.			S18-Ma15494	S18-Ma15495
Date Sampled			Feb 28, 2018	Feb 28, 2018
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene ^{N02}	0.5	mg/kg	93	< 0.5
TRH C6-C10	20	mg/kg	88	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	-	< 20
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	20	mg/kg	86	< 20
BTEX				
Benzene	0.1	mg/kg	90	< 0.1
Toluene	0.1	mg/kg	87	< 0.1
Ethylbenzene	0.1	mg/kg	89	< 0.1
m&p-Xylenes	0.2	mg/kg	87	< 0.2
o-Xylene	0.1	mg/kg	87	< 0.1
Xylenes - Total	0.3	mg/kg	87	< 0.3
4-Bromofluorobenzene (surr.)	1	%	91	57

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 (regarding both quality and NATA accreditation).

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
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Mar 14, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons	Sydney	Mar 14, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Mar 14, 2018	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Mar 14, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Eurofins mgt Suite B4			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Mar 14, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Sydney	Mar 14, 2018	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soils by GCMS			
Organochlorine Pesticides	Sydney	Mar 14, 2018	14 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Sydney	Mar 14, 2018	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Metals M8	Sydney	Mar 14, 2018	28 Day
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	Mar 14, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: MANN ST GOSFORD
Project ID: SYDGE214942

Order No.:
Report #: 589200
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Mar 14, 2018 12:00 AM
Due: Mar 15, 2018
Priority: 1 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Metals M8	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
External Laboratory											
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID						
1	BH5 0.2-0.5	Feb 28, 2018		Soil	S18-Ma15237		X		X	X	
2	BH5 0.6-0.9	Feb 28, 2018		Soil	S18-Ma15238		X		X	X	
3	P1 0.3-0.5	Feb 28, 2018		Soil	S18-Ma15239		X	X	X	X	
4	P2 0.7-0.8	Feb 27, 2018		Soil	S18-Ma15240		X		X	X	
5	P3 0.2-0.5	Feb 27, 2018		Soil	S18-Ma15241		X		X	X	
6	P4 0.2-0.5	Feb 27, 2018		Soil	S18-Ma15242		X		X	X	
7	P5 0.7-0.9	Feb 28, 2018		Soil	S18-Ma15243		X		X	X	
8	P6 0.2-0.6	Feb 28, 2018		Soil	S18-Ma15244		X		X	X	
9	P6 0.6-0.9	Feb 28, 2018		Soil	S18-Ma15245		X		X	X	

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Sample Detail						HOLD	Metals M8	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
10	P7 1.1-1.3	Feb 28, 2018		Soil	S18-Ma15246		X		X	X	
11	P8 0.6-0.9	Feb 28, 2018		Soil	S18-Ma15247		X		X	X	
12	BH10 0.3-0.7	Feb 28, 2018		Soil	S18-Ma15248		X		X	X	
13	R3	Feb 28, 2018		Water	S18-Ma15249		X	X		X	
14	BH5 1.2-1.6	Feb 28, 2018		Soil	S18-Ma15473	X					
15	BH5 2.2-2.6	Feb 28, 2018		Soil	S18-Ma15474	X					
16	P1 1.1-1.4	Feb 28, 2018		Soil	S18-Ma15475	X					
17	P1 1.7-2.0	Feb 28, 2018		Soil	S18-Ma15476	X					
18	P2 1.2-1.5	Feb 28, 2018		Soil	S18-Ma15477	X					
19	P2 2.2-2.5	Feb 28, 2018		Soil	S18-Ma15478	X					
20	P3 1.3-1.6	Feb 27, 2018		Soil	S18-Ma15479	X					
21	P3 2.4-2.6	Feb 27, 2018		Soil	S18-Ma15480	X					

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Sample Detail						HOLD	Metals M8	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
22	P4 0.8-1.8	Feb 27, 2018		Soil	S18-Ma15481	X					
23	P4 1.8-2	Feb 27, 2018		Soil	S18-Ma15482	X					
24	P4 2.0-3.0	Feb 27, 2018		Soil	S18-Ma15483	X					
25	P5 1.0-1.2	Feb 28, 2018		Soil	S18-Ma15484	X					
26	P5 1.4-1.6	Feb 28, 2018		Soil	S18-Ma15485	X					
27	P6 1.0-1.3	Feb 28, 2018		Soil	S18-Ma15486	X					
28	P7 1.5-1.8	Feb 28, 2018		Soil	S18-Ma15487	X					
29	P7 1.9-2.1	Feb 28, 2018		Soil	S18-Ma15488	X					
30	P8 1.5-1.7	Feb 28, 2018		Soil	S18-Ma15489	X					
31	P8 2.3-2.5	Feb 28, 2018		Soil	S18-Ma15490	X					
32	BH10-1.5-1.7	Feb 28, 2018		Soil	S18-Ma15491	X					
33	BH10-1.8-2.0	Feb 28, 2018		Soil	S18-Ma15492	X					

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Sample Detail						HOLD	Metals M8	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
34	TS4	Feb 28, 2018		Soil	S18-Ma15494						X
35	TB4	Feb 28, 2018		Soil	S18-Ma15495						X
36	DUP2	Feb 28, 2018		Soil	S18-Ma15565	X					
37	DUP3	Feb 28, 2018		Soil	S18-Ma15566	X					
38	DUP4	Feb 28, 2018		Soil	S18-Ma15567	X					
39	TRIP2	Feb 28, 2018		Soil	S18-Ma15568	X					
40	TRIP3	Feb 28, 2018		Soil	S18-Ma15569	X					
41	TRIP4	Feb 28, 2018		Soil	S18-Ma15570	X					
42	BH5 0.0-0.2	Feb 28, 2018		Soil	S18-Ma15593	X					
43	BH5 0.8-0.9	Feb 28, 2018		Soil	S18-Ma15594	X					
44	P1 0.1-0.3	Feb 28, 2018		Soil	S18-Ma15595	X					
45	P1 0.9-1.1	Feb 28, 2018		Soil	S18-Ma15596	X					

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Sample Detail						HOLD	Metals M8	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
46	P2 0.1-0.3	Feb 27, 2018		Soil	S18-Ma15597	X					
47	P3 0.1-0.2	Feb 27, 2018		Soil	S18-Ma15598	X					
48	P3 1.1-1.3	Feb 27, 2018		Soil	S18-Ma15599	X					
49	P4 0.2-0.5	Feb 27, 2018		Soil	S18-Ma15600	X					
50	P5 0.1-0.3	Feb 28, 2018		Soil	S18-Ma15601	X					
51	P5 1.6-1.8	Feb 28, 2018		Soil	S18-Ma15602	X					
52	P6 0.1-0.2	Feb 28, 2018		Soil	S18-Ma15603	X					
53	P6 0.6-0.9	Feb 28, 2018		Soil	S18-Ma15604	X					
54	P7 0.1-0.3	Feb 28, 2018		Soil	S18-Ma15605	X					
55	P8 0.5-0.6	Feb 28, 2018		Soil	S18-Ma15606	X					
56	P8 1.2-1.5	Feb 28, 2018		Soil	S18-Ma15607	X					
Test Counts						41	13	2	12	13	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota 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. 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	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NC	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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. 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 - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
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							
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							
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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	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 - 2013 NEPM Fractions							
Naphthalene	%	125			70-130	Pass	
TRH C6-C10	%	104			70-130	Pass	
TRH >C10-C16	%	79			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	85			70-130	Pass	
TRH C10-C14	%	76			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	96			70-130	Pass	
Toluene	%	94			70-130	Pass	
Ethylbenzene	%	104			70-130	Pass	
m&p-Xylenes	%	86			70-130	Pass	
o-Xylene	%	88			70-130	Pass	
Xylenes - Total	%	87			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	98			70-130	Pass	
Acenaphthylene	%	95			70-130	Pass	
Anthracene	%	105			70-130	Pass	
Benz(a)anthracene	%	95			70-130	Pass	
Benzo(a)pyrene	%	95			70-130	Pass	

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(b&j)fluoranthene				%	109			70-130	Pass	
Benzo(k)fluoranthene				%	109			70-130	Pass	
Chrysene				%	93			70-130	Pass	
Fluoranthene				%	107			70-130	Pass	
Fluorene				%	97			70-130	Pass	
Naphthalene				%	87			70-130	Pass	
Phenanthrene				%	98			70-130	Pass	
Pyrene				%	108			70-130	Pass	
LCS - % Recovery										
Organochlorine Pesticides										
4,4'-DDD				%	95			70-130	Pass	
4,4'-DDE				%	92			70-130	Pass	
4,4'-DDT				%	97			70-130	Pass	
a-BHC				%	93			70-130	Pass	
Aldrin				%	92			70-130	Pass	
b-BHC				%	89			70-130	Pass	
d-BHC				%	91			70-130	Pass	
Dieldrin				%	92			70-130	Pass	
Endosulfan I				%	91			70-130	Pass	
Endosulfan II				%	93			70-130	Pass	
Endosulfan sulphate				%	93			70-130	Pass	
Endrin				%	99			70-130	Pass	
Endrin aldehyde				%	94			70-130	Pass	
Endrin ketone				%	96			70-130	Pass	
g-BHC (Lindane)				%	91			70-130	Pass	
Heptachlor				%	93			70-130	Pass	
Heptachlor epoxide				%	91			70-130	Pass	
Hexachlorobenzene				%	90			70-130	Pass	
Methoxychlor				%	97			70-130	Pass	
LCS - % Recovery										
Polychlorinated Biphenyls										
Aroclor-1260				%	96			70-130	Pass	
LCS - % Recovery										
Heavy Metals										
Arsenic				%	91			70-130	Pass	
Cadmium				%	89			70-130	Pass	
Chromium				%	103			70-130	Pass	
Copper				%	107			70-130	Pass	
Lead				%	98			70-130	Pass	
Mercury				%	98			70-130	Pass	
Nickel				%	96			70-130	Pass	
Zinc				%	97			70-130	Pass	
Test	Lab Sample ID	QA Source		Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery										
Polycyclic Aromatic Hydrocarbons					Result 1					
Benzo(g,h,i)perylene	S18-Ma14370	NCP	%		75			70-130	Pass	
Dibenz(a,h)anthracene	S18-Ma13274	NCP	%		81			70-130	Pass	
Indeno(1,2,3-cd)pyrene	S18-Ma13274	NCP	%		82			70-130	Pass	
Spike - % Recovery										
Heavy Metals					Result 1					
Lead	S18-Ma13651	NCP	%		106			70-130	Pass	
Spike - % Recovery										
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					Result 1					
Naphthalene	S18-Ma15238	CP	%		124			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
TRH C6-C10	S18-Ma15238	CP	%	92		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1				
TRH C6-C9	S18-Ma15238	CP	%	77		70-130	Pass	
Spike - % Recovery								
BTEX				Result 1				
Benzene	S18-Ma15238	CP	%	83		70-130	Pass	
Toluene	S18-Ma15238	CP	%	83		70-130	Pass	
Ethylbenzene	S18-Ma15238	CP	%	89		70-130	Pass	
m&p-Xylenes	S18-Ma15238	CP	%	75		70-130	Pass	
o-Xylene	S18-Ma15238	CP	%	78		70-130	Pass	
Xylenes - Total	S18-Ma15238	CP	%	76		70-130	Pass	
Spike - % Recovery								
Polycyclic Aromatic Hydrocarbons				Result 1				
Acenaphthene	S18-Ma15238	CP	%	97		70-130	Pass	
Acenaphthylene	S18-Ma15238	CP	%	85		70-130	Pass	
Anthracene	S18-Ma15238	CP	%	88		70-130	Pass	
Benz(a)anthracene	S18-Ma15238	CP	%	88		70-130	Pass	
Benzo(a)pyrene	S18-Ma15238	CP	%	88		70-130	Pass	
Benzo(b&j)fluoranthene	S18-Ma15238	CP	%	95		70-130	Pass	
Benzo(k)fluoranthene	S18-Ma15238	CP	%	90		70-130	Pass	
Chrysene	S18-Ma15238	CP	%	90		70-130	Pass	
Fluoranthene	S18-Ma15238	CP	%	100		70-130	Pass	
Fluorene	S18-Ma15238	CP	%	88		70-130	Pass	
Naphthalene	S18-Ma15238	CP	%	84		70-130	Pass	
Phenanthrene	S18-Ma15238	CP	%	77		70-130	Pass	
Pyrene	S18-Ma15238	CP	%	107		70-130	Pass	
Spike - % Recovery								
Organochlorine Pesticides				Result 1				
4,4'-DDD	S18-Ma15704	NCP	%	120		70-130	Pass	
4,4'-DDE	S18-Ma11257	NCP	%	96		70-130	Pass	
4,4'-DDT	B18-Ma11441	NCP	%	112		70-130	Pass	
a-BHC	S18-Ma11257	NCP	%	96		70-130	Pass	
Aldrin	S18-Ma11257	NCP	%	96		70-130	Pass	
b-BHC	S18-Ma11257	NCP	%	72		70-130	Pass	
d-BHC	S18-Ma11257	NCP	%	88		70-130	Pass	
Dieldrin	S18-Ma11257	NCP	%	96		70-130	Pass	
Endosulfan I	S18-Ma11257	NCP	%	96		70-130	Pass	
Endosulfan II	S18-Ma11257	NCP	%	96		70-130	Pass	
Endosulfan sulphate	S18-Ma11257	NCP	%	80		70-130	Pass	
Endrin	S18-Ma11257	NCP	%	72		70-130	Pass	
Endrin aldehyde	S18-Ma11257	NCP	%	96		70-130	Pass	
Endrin ketone	S18-Ma15253	NCP	%	128		70-130	Pass	
g-BHC (Lindane)	S18-Ma11257	NCP	%	72		70-130	Pass	
Heptachlor	S18-Ma15253	NCP	%	88		70-130	Pass	
Heptachlor epoxide	S18-Ma11257	NCP	%	88		70-130	Pass	
Hexachlorobenzene	S18-Ma11257	NCP	%	96		70-130	Pass	
Methoxychlor	B18-Ma11441	NCP	%	112		70-130	Pass	
Spike - % Recovery								
Polychlorinated Biphenyls				Result 1				
Aroclor-1260	S18-Ma15704	NCP	%	81		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1				
Naphthalene	S18-Ma15248	CP	%	92		70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH C6-C10	S18-Ma15248	CP	%	77			70-130	Pass	
TRH >C10-C16	S18-Ma15248	CP	%	79			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S18-Ma15248	CP	%	72			70-130	Pass	
TRH C10-C14	S18-Ma15248	CP	%	77			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S18-Ma15248	CP	%	83			70-130	Pass	
Toluene	S18-Ma15248	CP	%	82			70-130	Pass	
Ethylbenzene	S18-Ma15248	CP	%	90			70-130	Pass	
m&p-Xylenes	S18-Ma15248	CP	%	79			70-130	Pass	
o-Xylene	S18-Ma15248	CP	%	80			70-130	Pass	
Xylenes - Total	S18-Ma15248	CP	%	79			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S18-Ma15248	CP	%	91			70-130	Pass	
Acenaphthylene	S18-Ma15248	CP	%	88			70-130	Pass	
Anthracene	S18-Ma15248	CP	%	96			70-130	Pass	
Benz(a)anthracene	S18-Ma15248	CP	%	94			70-130	Pass	
Benzo(a)pyrene	S18-Ma15248	CP	%	94			70-130	Pass	
Benzo(b&j)fluoranthene	S18-Ma15248	CP	%	103			70-130	Pass	
Benzo(k)fluoranthene	S18-Ma15248	CP	%	99			70-130	Pass	
Chrysene	S18-Ma15248	CP	%	90			70-130	Pass	
Fluoranthene	S18-Ma15248	CP	%	103			70-130	Pass	
Fluorene	S18-Ma15248	CP	%	91			70-130	Pass	
Naphthalene	S18-Ma15248	CP	%	80			70-130	Pass	
Phenanthrene	S18-Ma15248	CP	%	91			70-130	Pass	
Pyrene	S18-Ma15248	CP	%	104			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S18-Ma15248	CP	%	80			70-130	Pass	
Cadmium	S18-Ma15248	CP	%	89			70-130	Pass	
Chromium	S18-Ma15248	CP	%	93			70-130	Pass	
Copper	S18-Ma15248	CP	%	95			70-130	Pass	
Mercury	S18-Ma15248	CP	%	110			70-130	Pass	
Nickel	S18-Ma15248	CP	%	103			70-130	Pass	
Zinc	S18-Ma15248	CP	%	103			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S18-Ma15237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S18-Ma15237	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S18-Ma15237	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S18-Ma15237	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S18-Ma15237	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S18-Ma15237	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S18-Ma15237	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S18-Ma15237	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S18-Ma15237	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	

Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Acenaphthene	S18-Ma15237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Acenaphthylene	S18-Ma15237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Anthracene	S18-Ma15237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benz(a)anthracene	S18-Ma15237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(a)pyrene	S18-Ma15237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(b&j)fluoranthene	S18-Ma15237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(g,h,i)perylene	S18-Ma15237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(k)fluoranthene	S18-Ma15237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chrysene	S18-Ma15237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dibenz(a,h)anthracene	S18-Ma15237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluoranthene	S18-Ma15237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluorene	S18-Ma15237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	S18-Ma15237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Naphthalene	S18-Ma15237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Phenanthrene	S18-Ma15237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Pyrene	S18-Ma15237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	S18-Ma13650	NCP	mg/kg	2.3	2.1	6.0	30%	Pass
Cadmium	S18-Ma13650	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	S18-Ma15237	CP	%	3.8	4.1	6.0	30%	Pass
Duplicate								
Organochlorine Pesticides				Result 1	Result 2	RPD		
Chlordanes - Total	S18-Ma11256	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
4,4'-DDD	S18-Ma11256	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4,4'-DDE	S18-Ma11256	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4,4'-DDT	S18-Ma11256	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
a-BHC	S18-Ma11256	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Aldrin	S18-Ma11256	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
b-BHC	S18-Ma11256	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
d-BHC	S18-Ma11256	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Dieldrin	S18-Ma11256	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan I	S18-Ma11256	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan II	S18-Ma11256	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan sulphate	S18-Ma11256	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin	S18-Ma11256	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin aldehyde	S18-Ma11256	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin ketone	S18-Ma11256	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
g-BHC (Lindane)	S18-Ma11256	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor	S18-Ma11256	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor epoxide	S18-Ma11256	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Hexachlorobenzene	S18-Ma11256	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Methoxychlor	S18-Ma11256	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Toxaphene	S18-Ma11256	NCP	mg/kg	< 1	< 1	<1	30%	Pass
Duplicate								
Polychlorinated Biphenyls				Result 1	Result 2	RPD		
Aroclor-1016	S18-Ma11256	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1221	S18-Ma11256	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1232	S18-Ma11256	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1242	S18-Ma11256	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1248	S18-Ma11256	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1254	S18-Ma11256	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1260	S18-Ma11256	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass

Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
Naphthalene	S18-Ma15247	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
TRH C6-C10	S18-Ma15247	CP	mg/kg	< 20	< 20	<1	30%	Pass
TRH >C10-C16	S18-Ma15247	CP	mg/kg	< 50	< 50	<1	30%	Pass
TRH >C16-C34	S18-Ma15247	CP	mg/kg	< 100	< 100	<1	30%	Pass
TRH >C34-C40	S18-Ma15247	CP	mg/kg	< 100	< 100	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD		
TRH C6-C9	S18-Ma15247	CP	mg/kg	< 20	< 20	<1	30%	Pass
TRH C10-C14	S18-Ma15247	CP	mg/kg	< 20	< 20	<1	30%	Pass
TRH C15-C28	S18-Ma15247	CP	mg/kg	< 50	< 50	<1	30%	Pass
TRH C29-C36	S18-Ma15247	CP	mg/kg	< 50	< 50	<1	30%	Pass
Duplicate								
BTEX				Result 1	Result 2	RPD		
Benzene	S18-Ma15247	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Toluene	S18-Ma15247	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Ethylbenzene	S18-Ma15247	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
m&p-Xylenes	S18-Ma15247	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
o-Xylene	S18-Ma15247	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Xylenes - Total	S18-Ma15247	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass
Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Acenaphthene	S18-Ma15247	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Acenaphthylene	S18-Ma15247	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Anthracene	S18-Ma15247	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benz(a)anthracene	S18-Ma15247	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(a)pyrene	S18-Ma15247	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(b&j)fluoranthene	S18-Ma15247	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(g,h,i)perylene	S18-Ma15247	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(k)fluoranthene	S18-Ma15247	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chrysene	S18-Ma15247	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dibenz(a,h)anthracene	S18-Ma15247	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluoranthene	S18-Ma15247	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluorene	S18-Ma15247	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	S18-Ma15247	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Naphthalene	S18-Ma15247	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Phenanthrene	S18-Ma15247	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Pyrene	S18-Ma15247	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Chromium	S18-Ma15247	CP	mg/kg	12	11	10	30%	Pass
Copper	S18-Ma15247	CP	mg/kg	5.3	< 5	10	30%	Pass
Lead	S18-Ma15247	CP	mg/kg	14	12	17	30%	Pass
Mercury	S18-Ma15247	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Nickel	S18-Ma15247	CP	mg/kg	5.0	5.3	5.0	30%	Pass
Zinc	S18-Ma15247	CP	mg/kg	21	19	11	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	S18-Ma15247	CP	%	23	22	2.0	30%	Pass

Comments

Sample Integrity

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

Comments

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
R20	This sample is a Trip Spike and therefore all results are reported as a percentage

Authorised By

Nibha Vaidya Analytical Services Manager



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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Certificate of Analysis

Coffey Environments Pty Ltd NSW
Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Simon Hay

Report 589200-W
Project name MANN ST GOSFORD
Project ID SYDGE214942
Received Date Mar 14, 2018

Client Sample ID			R3
Sample Matrix			Water
Eurofins mgt Sample No.			S18-Ma15249
Date Sampled			Feb 28, 2018
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	0.02	mg/L	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1
TRH C10-36 (Total)	0.1	mg/L	< 0.1
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003
4-Bromofluorobenzene (surr.)	1	%	55
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene ^{N02}	0.01	mg/L	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1
Polycyclic Aromatic Hydrocarbons			
Acenaphthene	0.001	mg/L	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001
Anthracene	0.001	mg/L	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001
Chrysene	0.001	mg/L	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001
Fluoranthene	0.001	mg/L	< 0.001
Fluorene	0.001	mg/L	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001

Client Sample ID			R3
Sample Matrix			Water
Eurofins mgt Sample No.			S18-Ma15249
Date Sampled			Feb 28, 2018
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Naphthalene	0.001	mg/L	< 0.001
Phenanthrene	0.001	mg/L	< 0.001
Pyrene	0.001	mg/L	< 0.001
Total PAH*	0.001	mg/L	< 0.001
2-Fluorobiphenyl (surr.)	1	%	91
p-Terphenyl-d14 (surr.)	1	%	90
Organochlorine Pesticides			
Chlordanes - Total	0.001	mg/L	< 0.001
4,4'-DDD	0.0001	mg/L	< 0.0001
4,4'-DDE	0.0001	mg/L	< 0.0001
4,4'-DDT	0.0001	mg/L	< 0.0001
α-BHC	0.0001	mg/L	< 0.0001
Aldrin	0.0001	mg/L	< 0.0001
β-BHC	0.0001	mg/L	< 0.0001
δ-BHC	0.0001	mg/L	< 0.0001
Dieldrin	0.0001	mg/L	< 0.0001
Endosulfan I	0.0001	mg/L	< 0.0001
Endosulfan II	0.0001	mg/L	< 0.0001
Endosulfan sulphate	0.0001	mg/L	< 0.0001
Endrin	0.0001	mg/L	< 0.0001
Endrin aldehyde	0.0001	mg/L	< 0.0001
Endrin ketone	0.0001	mg/L	< 0.0001
γ-BHC (Lindane)	0.0001	mg/L	< 0.0001
Heptachlor	0.0001	mg/L	< 0.0001
Heptachlor epoxide	0.0001	mg/L	< 0.0001
Hexachlorobenzene	0.0001	mg/L	< 0.0001
Methoxychlor	0.0001	mg/L	< 0.0001
Toxaphene	0.01	mg/L	< 0.01
Aldrin and Dieldrin (Total)*	0.0001	mg/L	< 0.0001
DDT + DDE + DDD (Total)*	0.0001	mg/L	< 0.0001
Vic EPA IWRG 621 OCP (Total)*	0.001	mg/L	< 0.001
Vic EPA IWRG 621 Other OCP (Total)*	0.001	mg/L	< 0.001
Dibutylchloroendate (surr.)	1	%	77
Tetrachloro-m-xylene (surr.)	1	%	84
Polychlorinated Biphenyls			
Aroclor-1016	0.005	mg/L	< 0.005
Aroclor-1221	0.001	mg/L	< 0.001
Aroclor-1232	0.005	mg/L	< 0.005
Aroclor-1242	0.005	mg/L	< 0.005
Aroclor-1248	0.005	mg/L	< 0.005
Aroclor-1254	0.005	mg/L	< 0.005
Aroclor-1260	0.005	mg/L	< 0.005
Total PCB*	0.001	mg/L	< 0.001
Dibutylchloroendate (surr.)	1	%	77
Tetrachloro-m-xylene (surr.)	1	%	84

Client Sample ID			R3
Sample Matrix			Water
Eurofins mgt Sample No.			S18-Ma15249
Date Sampled			Feb 28, 2018
Test/Reference	LOR	Unit	
Heavy Metals			
Arsenic	0.001	mg/L	< 0.001
Cadmium	0.0002	mg/L	< 0.0002
Chromium	0.001	mg/L	< 0.001
Copper	0.001	mg/L	0.001
Lead	0.001	mg/L	< 0.001
Mercury	0.0001	mg/L	< 0.0001
Nickel	0.001	mg/L	< 0.001
Zinc	0.005	mg/L	< 0.005

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 (regarding both quality and NATA accreditation).

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
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Mar 14, 2018	7 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Mar 14, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Mar 14, 2018	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Eurofins mgt Suite B4			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Mar 14, 2018	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Sydney	Mar 14, 2018	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Water by GCMS			
Organochlorine Pesticides	Sydney	Mar 14, 2018	7 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Sydney	Mar 14, 2018	7 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Metals M8	Sydney	Mar 14, 2018	28 Day
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Project Name: MANN ST GOSFORD
Project ID: SYDGE214942

Order No.:
Report #: 589200
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Mar 14, 2018 12:00 AM
Due: Mar 15, 2018
Priority: 1 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Metals M8	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
External Laboratory											
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID						
1	BH5 0.2-0.5	Feb 28, 2018		Soil	S18-Ma15237		X		X	X	
2	BH5 0.6-0.9	Feb 28, 2018		Soil	S18-Ma15238		X		X	X	
3	P1 0.3-0.5	Feb 28, 2018		Soil	S18-Ma15239		X	X	X	X	
4	P2 0.7-0.8	Feb 27, 2018		Soil	S18-Ma15240		X		X	X	
5	P3 0.2-0.5	Feb 27, 2018		Soil	S18-Ma15241		X		X	X	
6	P4 0.2-0.5	Feb 27, 2018		Soil	S18-Ma15242		X		X	X	
7	P5 0.7-0.9	Feb 28, 2018		Soil	S18-Ma15243		X		X	X	
8	P6 0.2-0.6	Feb 28, 2018		Soil	S18-Ma15244		X		X	X	
9	P6 0.6-0.9	Feb 28, 2018		Soil	S18-Ma15245		X		X	X	

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Sample Detail						HOLD	Metals M8	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
10	P7 1.1-1.3	Feb 28, 2018		Soil	S18-Ma15246		X		X	X	
11	P8 0.6-0.9	Feb 28, 2018		Soil	S18-Ma15247		X		X	X	
12	BH10 0.3-0.7	Feb 28, 2018		Soil	S18-Ma15248		X		X	X	
13	R3	Feb 28, 2018		Water	S18-Ma15249		X	X		X	
14	BH5 1.2-1.6	Feb 28, 2018		Soil	S18-Ma15473	X					
15	BH5 2.2-2.6	Feb 28, 2018		Soil	S18-Ma15474	X					
16	P1 1.1-1.4	Feb 28, 2018		Soil	S18-Ma15475	X					
17	P1 1.7-2.0	Feb 28, 2018		Soil	S18-Ma15476	X					
18	P2 1.2-1.5	Feb 28, 2018		Soil	S18-Ma15477	X					
19	P2 2.2-2.5	Feb 28, 2018		Soil	S18-Ma15478	X					
20	P3 1.3-1.6	Feb 27, 2018		Soil	S18-Ma15479	X					
21	P3 2.4-2.6	Feb 27, 2018		Soil	S18-Ma15480	X					

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Sample Detail						HOLD	Metals M8	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
22	P4 0.8-1.8	Feb 27, 2018		Soil	S18-Ma15481	X					
23	P4 1.8-2	Feb 27, 2018		Soil	S18-Ma15482	X					
24	P4 2.0-3.0	Feb 27, 2018		Soil	S18-Ma15483	X					
25	P5 1.0-1.2	Feb 28, 2018		Soil	S18-Ma15484	X					
26	P5 1.4-1.6	Feb 28, 2018		Soil	S18-Ma15485	X					
27	P6 1.0-1.3	Feb 28, 2018		Soil	S18-Ma15486	X					
28	P7 1.5-1.8	Feb 28, 2018		Soil	S18-Ma15487	X					
29	P7 1.9-2.1	Feb 28, 2018		Soil	S18-Ma15488	X					
30	P8 1.5-1.7	Feb 28, 2018		Soil	S18-Ma15489	X					
31	P8 2.3-2.5	Feb 28, 2018		Soil	S18-Ma15490	X					
32	BH10-1.5-1.7	Feb 28, 2018		Soil	S18-Ma15491	X					
33	BH10-1.8-2.0	Feb 28, 2018		Soil	S18-Ma15492	X					

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Sample Detail						HOLD	Metals M8	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
34	TS4	Feb 28, 2018		Soil	S18-Ma15494						X
35	TB4	Feb 28, 2018		Soil	S18-Ma15495						X
36	DUP2	Feb 28, 2018		Soil	S18-Ma15565	X					
37	DUP3	Feb 28, 2018		Soil	S18-Ma15566	X					
38	DUP4	Feb 28, 2018		Soil	S18-Ma15567	X					
39	TRIP2	Feb 28, 2018		Soil	S18-Ma15568	X					
40	TRIP3	Feb 28, 2018		Soil	S18-Ma15569	X					
41	TRIP4	Feb 28, 2018		Soil	S18-Ma15570	X					
42	BH5 0.0-0.2	Feb 28, 2018		Soil	S18-Ma15593	X					
43	BH5 0.8-0.9	Feb 28, 2018		Soil	S18-Ma15594	X					
44	P1 0.1-0.3	Feb 28, 2018		Soil	S18-Ma15595	X					
45	P1 0.9-1.1	Feb 28, 2018		Soil	S18-Ma15596	X					

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Received: Mar 14, 2018 12:00 AM
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Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Metals M8	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
46	P2 0.1-0.3	Feb 27, 2018		Soil	S18-Ma15597	X					
47	P3 0.1-0.2	Feb 27, 2018		Soil	S18-Ma15598	X					
48	P3 1.1-1.3	Feb 27, 2018		Soil	S18-Ma15599	X					
49	P4 0.2-0.5	Feb 27, 2018		Soil	S18-Ma15600	X					
50	P5 0.1-0.3	Feb 28, 2018		Soil	S18-Ma15601	X					
51	P5 1.6-1.8	Feb 28, 2018		Soil	S18-Ma15602	X					
52	P6 0.1-0.2	Feb 28, 2018		Soil	S18-Ma15603	X					
53	P6 0.6-0.9	Feb 28, 2018		Soil	S18-Ma15604	X					
54	P7 0.1-0.3	Feb 28, 2018		Soil	S18-Ma15605	X					
55	P8 0.5-0.6	Feb 28, 2018		Soil	S18-Ma15606	X					
56	P8 1.2-1.5	Feb 28, 2018		Soil	S18-Ma15607	X					
Test Counts						41	13	2	12	13	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota 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. 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	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NC	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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. 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/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g,h,i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a,h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1,2,3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/L	< 0.001			0.001	Pass	
4,4'-DDD	mg/L	< 0.0001			0.0001	Pass	
4,4'-DDE	mg/L	< 0.0001			0.0001	Pass	
4,4'-DDT	mg/L	< 0.0001			0.0001	Pass	
a-BHC	mg/L	< 0.0001			0.0001	Pass	
Aldrin	mg/L	< 0.0001			0.0001	Pass	
b-BHC	mg/L	< 0.0001			0.0001	Pass	
d-BHC	mg/L	< 0.0001			0.0001	Pass	
Dieldrin	mg/L	< 0.0001			0.0001	Pass	
Endosulfan I	mg/L	< 0.0001			0.0001	Pass	
Endosulfan II	mg/L	< 0.0001			0.0001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/L	< 0.0001			0.0001	Pass	
Endrin	mg/L	< 0.0001			0.0001	Pass	
Endrin aldehyde	mg/L	< 0.0001			0.0001	Pass	
Endrin ketone	mg/L	< 0.0001			0.0001	Pass	
g-BHC (Lindane)	mg/L	< 0.0001			0.0001	Pass	
Heptachlor	mg/L	< 0.0001			0.0001	Pass	
Heptachlor epoxide	mg/L	< 0.0001			0.0001	Pass	
Hexachlorobenzene	mg/L	< 0.0001			0.0001	Pass	
Methoxychlor	mg/L	< 0.0001			0.0001	Pass	
Toxaphene	mg/L	< 0.01			0.01	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/L	< 0.005			0.005	Pass	
Aroclor-1221	mg/L	< 0.001			0.001	Pass	
Aroclor-1232	mg/L	< 0.005			0.005	Pass	
Aroclor-1242	mg/L	< 0.005			0.005	Pass	
Aroclor-1248	mg/L	< 0.005			0.005	Pass	
Aroclor-1254	mg/L	< 0.005			0.005	Pass	
Aroclor-1260	mg/L	< 0.005			0.005	Pass	
Total PCB*	mg/L	< 0.001			0.001	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	81			70-130	Pass	
TRH C10-C14	%	71			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	90			70-130	Pass	
Toluene	%	84			70-130	Pass	
Ethylbenzene	%	105			70-130	Pass	
m&p-Xylenes	%	79			70-130	Pass	
o-Xylene	%	108			70-130	Pass	
Xylenes - Total	%	88			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	125			70-130	Pass	
TRH C6-C10	%	114			70-130	Pass	
TRH >C10-C16	%	72			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	83			70-130	Pass	
Acenaphthylene	%	92			70-130	Pass	
Anthracene	%	102			70-130	Pass	
Benz(a)anthracene	%	106			70-130	Pass	
Benzo(a)pyrene	%	103			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(b&j)fluoranthene			%	104			70-130	Pass	
Benzo(g,h,i)perylene			%	121			70-130	Pass	
Benzo(k)fluoranthene			%	105			70-130	Pass	
Chrysene			%	108			70-130	Pass	
Dibenz(a,h)anthracene			%	116			70-130	Pass	
Fluoranthene			%	110			70-130	Pass	
Fluorene			%	92			70-130	Pass	
Indeno(1,2,3-cd)pyrene			%	116			70-130	Pass	
Naphthalene			%	88			70-130	Pass	
Phenanthrene			%	102			70-130	Pass	
Pyrene			%	110			70-130	Pass	
LCS - % Recovery									
Organochlorine Pesticides									
4,4'-DDD			%	77			70-130	Pass	
4,4'-DDE			%	80			70-130	Pass	
4,4'-DDT			%	83			70-130	Pass	
a-BHC			%	73			70-130	Pass	
Aldrin			%	74			70-130	Pass	
b-BHC			%	76			70-130	Pass	
d-BHC			%	77			70-130	Pass	
Dieldrin			%	79			70-130	Pass	
Endosulfan I			%	77			70-130	Pass	
Endosulfan II			%	77			70-130	Pass	
Endosulfan sulphate			%	81			70-130	Pass	
Endrin			%	82			70-130	Pass	
Endrin aldehyde			%	76			70-130	Pass	
Endrin ketone			%	79			70-130	Pass	
g-BHC (Lindane)			%	76			70-130	Pass	
Heptachlor			%	75			70-130	Pass	
Heptachlor epoxide			%	77			70-130	Pass	
Hexachlorobenzene			%	70			70-130	Pass	
Methoxychlor			%	81			70-130	Pass	
LCS - % Recovery									
Polychlorinated Biphenyls									
Aroclor-1260			%	80			70-130	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic			%	107			70-130	Pass	
Cadmium			%	109			70-130	Pass	
Chromium			%	103			70-130	Pass	
Copper			%	103			70-130	Pass	
Lead			%	105			70-130	Pass	
Mercury			%	109			70-130	Pass	
Nickel			%	102			70-130	Pass	
Zinc			%	104			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S18-Ma12896	NCP	%	101			70-130	Pass	
Cadmium	S18-Ma12896	NCP	%	105			70-130	Pass	
Chromium	S18-Ma12896	NCP	%	102			70-130	Pass	
Copper	S18-Ma12896	NCP	%	102			70-130	Pass	
Lead	S18-Ma12896	NCP	%	105			70-130	Pass	
Mercury	S18-Ma12896	NCP	%	110			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Nickel	S18-Ma12896	NCP	%	102			70-130	Pass	
Zinc	S18-Ma12896	NCP	%	102			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S18-Ma12895	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium	M18-Ma14725	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	S18-Ma12895	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	S18-Ma12895	NCP	mg/L	0.001	0.001	1.0	30%	Pass	
Lead	S18-Ma12895	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury	M18-Ma14725	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	S18-Ma12895	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc	S18-Ma12895	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	

Comments

Sample Integrity

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

Comments

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

Authorised By

Nibha Vaidya Analytical Services Manager



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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**SPECIALISTS IN ENVIRONMENTAL,
SOCIAL AND SAFETY PERFORMANCE**

Consigning Office: Chatswood

Report Results to: Simon Hay

Mobile:

Email:

simon.hay@coffey.com

Invoices to: Simon Hay

Phone: 0427 643 063

Email:

luke.steller@coffey.com

[illegible]

Sample Receipt Advice

Company name: **Coffey Environments Pty Ltd NSW**

Contact name: **Simon Hay**

Project name: **MANN ST GOSFORD**

Project ID: **SYDGE214942**

COC number: **Not provided**

Turn around time: **1 Day**

Date/Time received: **Mar 5, 2018 11:37 AM**

Eurofins | mgt reference: **587713**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt
Sample Receipt : 23.1 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Simon Hay - simon.hay@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Environments Pty Ltd NSW email address.

Certificate of Analysis

Coffey Environments Pty Ltd NSW
Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Attention: **Simon Hay**

Report **587713-S**
Project name MANN ST GOSFORD
Project ID SYDGE214942
Received Date Mar 05, 2018

Client Sample ID			BH6 (1.6-2.0M)	BH6 (2.4-2.7M)	BH7 (2.5-2.7M)	BH7 (2.8-3.0M)
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Ma03999	S18-Ma04000	S18-Ma04001	S18-Ma04002
Date Sampled			Mar 01, 2018	Mar 01, 2018	Mar 02, 2018	Mar 02, 2018
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.5	5.6	6.2	5.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.5	3.7	2.9	3.1
Reaction Ratings* ^{S05}		comment	4.0	2.0	2.0	4.0

Sample History

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

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

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

Acid Sulfate Soils Field pH Test

Testing Site

Sydney

Extracted

Mar 06, 2018

Holding Time

7 Days

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

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Project Name: MANN ST GOSFORD
Project ID: SYDGE214942

Order No.:
Report #: 587713
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Mar 5, 2018 11:37 AM
Due: Mar 6, 2018
Priority: 1 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Acid Sulfate Soils Field pH Test
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						X
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						
External Laboratory						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID	
1	BH6 (1.6-2.0M)	Mar 01, 2018		Soil	S18-Ma03999	X
2	BH6 (2.4-2.7M)	Mar 01, 2018		Soil	S18-Ma04000	X
3	BH7 (2.5-2.7M)	Mar 02, 2018		Soil	S18-Ma04001	X
4	BH7 (2.8-3.0M)	Mar 02, 2018		Soil	S18-Ma04002	X
Test Counts						4

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

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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. 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.

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

Comments

Qualifier Codes/Comments

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

Authorised By

Nibha Vaidya Analytical Services Manager

Glenn Jackson

National Operations Manager

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins | mgt shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins | mgt be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Coffey Environments Version: 4 Issue Date: 23/08/2012

Sample Receipt Advice

Company name: **Coffey Environments Pty Ltd NSW**

Contact name: Simon Hay
Project name: MANN ST GOSFORD
Project ID: SYDGE214942
COC number: Not provided
Turn around time: 5 Day
Date/Time received: Mar 5, 2018 11:37 AM
Eurofins | mgt reference: **587720**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt
Sample Receipt : 23.1 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Sample containers for volatile analysis received with zero headspace.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Simon Hay - simon.hay@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Environments Pty Ltd NSW email address.

Certificate of Analysis

Coffey Environments Pty Ltd NSW
Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Simon Hay

Report 587720-S
Project name MANN ST GOSFORD
Project ID SYDGE214942
Received Date Mar 05, 2018

Client Sample ID			BH6 (0-0.3M)	BH6 (0.8-1.0M)	BH7 (0-0.5M)	BH7 (1.5-2.0M)
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Ma04174	S18-Ma04175	S18-Ma04176	S18-Ma04177
Date Sampled			Mar 01, 2018	Mar 01, 2018	Mar 02, 2018	Mar 02, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	58
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	58
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	59	59	56	62
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			BH6 (0-0.3M)	BH6 (0.8-1.0M)	BH7 (0-0.5M)	BH7 (1.5-2.0M)
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Ma04174	S18-Ma04175	S18-Ma04176	S18-Ma04177
Date Sampled			Mar 01, 2018	Mar 01, 2018	Mar 02, 2018	Mar 02, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	134	107	73	76
p-Terphenyl-d14 (surr.)	1	%	128	107	71	70
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	-
α-BHC	0.05	mg/kg	-	-	< 0.05	-
Aldrin	0.05	mg/kg	-	-	< 0.05	-
β-BHC	0.05	mg/kg	-	-	< 0.05	-
δ-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	-
γ-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	0.2	mg/kg	-	-	< 0.2	-
Toxaphene	1	mg/kg	-	-	< 1	-
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	-
Dibutylchloroendate (surr.)	1	%	-	-	61	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	72	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1221	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1232	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1242	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1248	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1254	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1260	0.5	mg/kg	-	-	< 0.5	-
Total PCB*	0.5	mg/kg	-	-	< 0.5	-
Dibutylchloroendate (surr.)	1	%	-	-	61	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	72	-

Client Sample ID			BH6 (0-0.3M)	BH6 (0.8-1.0M)	BH7 (0-0.5M)	BH7 (1.5-2.0M)
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Ma04174	S18-Ma04175	S18-Ma04176	S18-Ma04177
Date Sampled			Mar 01, 2018	Mar 01, 2018	Mar 02, 2018	Mar 02, 2018
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	4.3	4.9
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	< 5	< 5	11	6.1
Copper	5	mg/kg	< 5	< 5	5.1	5.6
Lead	5	mg/kg	25	27	13	10
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	6.2	11	19	18
% Moisture	1	%	5.5	4.9	11	16

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 (regarding both quality and NATA accreditation).

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 mgt Suite B4			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Mar 08, 2018	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Mar 08, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Mar 08, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Mar 08, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Sydney	Mar 08, 2018	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soils by GCMS			
Organochlorine Pesticides	Sydney	Mar 08, 2018	14 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Sydney	Mar 08, 2018	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Metals M8	Sydney	Mar 08, 2018	28 Day
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	Mar 05, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: MANN ST GOSFORD
Project ID: SYDGE214942

Order No.:
Report #: 587720
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Mar 5, 2018 11:37 AM
Due: Mar 12, 2018
Priority: 5 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Metals M8	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
External Laboratory										
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID					
1	BH6 (0-0.3M)	Mar 01, 2018		Soil	S18-Ma04174		X		X	X
2	BH6 (0.8-1.0M)	Mar 01, 2018		Soil	S18-Ma04175		X		X	X
3	BH7 (0-0.5M)	Mar 02, 2018		Soil	S18-Ma04176		X	X	X	X
4	BH7 (1.5-2.0M)	Mar 02, 2018		Soil	S18-Ma04177		X		X	X
5	R4	Mar 02, 2018		Water	S18-Ma04178		X	X		X
6	DUP5	Mar 02, 2018		Soil	S18-Ma04179	X				
7	BH6 (1.6-2.0M)	Mar 01, 2018		Soil	S18-Ma04180	X				

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Project Name: MANN ST GOSFORD
Project ID: SYDGE214942

Order No.:
Report #: 587720
Phone: +61 2 9406 1000
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Received: Mar 5, 2018 11:37 AM
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Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Metals M8	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
8	BH6 (2.4-2.7M)	Mar 01, 2018		Soil	S18-Ma04181	X				
9	BH7 (2.5-2.7M)	Mar 02, 2018		Soil	S18-Ma04182	X				
10	BH7 (2.8-3.0M)	Mar 02, 2018		Soil	S18-Ma04183	X				
Test Counts						5	5	2	4	5

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota 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. 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	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NC	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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. 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	
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							
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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	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	%	87			70-130	Pass	
TRH C10-C14	%	85			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	88			70-130	Pass	
Toluene	%	98			70-130	Pass	
Ethylbenzene	%	94			70-130	Pass	
m&p-Xylenes	%	105			70-130	Pass	
o-Xylene	%	102			70-130	Pass	
Xylenes - Total	%	104			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	124			70-130	Pass	
TRH C6-C10	%	85			70-130	Pass	
TRH >C10-C16	%	89			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	99			70-130	Pass	
Acenaphthylene	%	98			70-130	Pass	
Anthracene	%	102			70-130	Pass	
Benz(a)anthracene	%	101			70-130	Pass	
Benzo(a)pyrene	%	102			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(b&j)fluoranthene			%	100			70-130	Pass	
Benzo(g,h,i)perylene			%	94			70-130	Pass	
Benzo(k)fluoranthene			%	99			70-130	Pass	
Chrysene			%	99			70-130	Pass	
Dibenz(a,h)anthracene			%	99			70-130	Pass	
Fluoranthene			%	105			70-130	Pass	
Fluorene			%	99			70-130	Pass	
Indeno(1.2.3-cd)pyrene			%	100			70-130	Pass	
Naphthalene			%	88			70-130	Pass	
Phenanthrene			%	99			70-130	Pass	
Pyrene			%	107			70-130	Pass	
LCS - % Recovery									
Organochlorine Pesticides									
4,4'-DDD			%	116			70-130	Pass	
4,4'-DDE			%	117			70-130	Pass	
4,4'-DDT			%	121			70-130	Pass	
a-BHC			%	110			70-130	Pass	
Aldrin			%	114			70-130	Pass	
b-BHC			%	109			70-130	Pass	
d-BHC			%	110			70-130	Pass	
Dieldrin			%	118			70-130	Pass	
Endosulfan I			%	115			70-130	Pass	
Endosulfan II			%	112			70-130	Pass	
Endosulfan sulphate			%	121			70-130	Pass	
Endrin			%	125			70-130	Pass	
Endrin aldehyde			%	115			70-130	Pass	
Endrin ketone			%	126			70-130	Pass	
g-BHC (Lindane)			%	113			70-130	Pass	
Heptachlor			%	107			70-130	Pass	
Heptachlor epoxide			%	115			70-130	Pass	
Hexachlorobenzene			%	107			70-130	Pass	
Methoxychlor			%	122			70-130	Pass	
LCS - % Recovery									
Polychlorinated Biphenyls									
Aroclor-1260			%	95			70-130	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic			%	102			70-130	Pass	
Cadmium			%	104			70-130	Pass	
Chromium			%	100			70-130	Pass	
Copper			%	98			70-130	Pass	
Lead			%	98			70-130	Pass	
Mercury			%	94			70-130	Pass	
Nickel			%	99			70-130	Pass	
Zinc			%	97			70-130	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	S18-Ma07468	NCP	%	82			70-130	Pass	
TRH C10-C14	S18-Ma10694	NCP	%	97			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S18-Ma07468	NCP	%	80			70-130	Pass	
Toluene	S18-Ma07468	NCP	%	87			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Ethylbenzene	S18-Ma07468	NCP	%	83			70-130	Pass	
m&p-Xylenes	S18-Ma07468	NCP	%	91			70-130	Pass	
o-Xylene	S18-Ma07468	NCP	%	87			70-130	Pass	
Xylenes - Total	S18-Ma07468	NCP	%	90			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S18-Ma07468	NCP	%	119			70-130	Pass	
TRH C6-C10	S18-Ma07468	NCP	%	84			70-130	Pass	
TRH >C10-C16	S18-Ma10694	NCP	%	96			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	B18-Ma05121	NCP	%	105			70-130	Pass	
Acenaphthylene	B18-Ma05121	NCP	%	105			70-130	Pass	
Anthracene	B18-Ma05121	NCP	%	114			70-130	Pass	
Benz(a)anthracene	B18-Ma05121	NCP	%	107			70-130	Pass	
Benzo(a)pyrene	B18-Ma05121	NCP	%	109			70-130	Pass	
Benzo(b&j)fluoranthene	B18-Ma05121	NCP	%	109			70-130	Pass	
Benzo(g,h,i)perylene	B18-Ma05121	NCP	%	98			70-130	Pass	
Benzo(k)fluoranthene	B18-Ma05121	NCP	%	107			70-130	Pass	
Chrysene	B18-Ma05121	NCP	%	102			70-130	Pass	
Dibenz(a,h)anthracene	B18-Ma05121	NCP	%	98			70-130	Pass	
Fluoranthene	B18-Ma05121	NCP	%	114			70-130	Pass	
Fluorene	B18-Ma05121	NCP	%	113			70-130	Pass	
Indeno(1,2,3-cd)pyrene	B18-Ma05121	NCP	%	102			70-130	Pass	
Naphthalene	B18-Ma05121	NCP	%	94			70-130	Pass	
Phenanthrene	B18-Ma05121	NCP	%	112			70-130	Pass	
Pyrene	B18-Ma05121	NCP	%	114			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S18-Ma07468	NCP	%	91			70-130	Pass	
Cadmium	S18-Ma07468	NCP	%	98			70-130	Pass	
Chromium	S18-Ma07468	NCP	%	78			70-130	Pass	
Copper	S18-Ma07468	NCP	%	78			70-130	Pass	
Lead	S18-Ma07468	NCP	%	79			70-130	Pass	
Mercury	S18-Ma07468	NCP	%	101			70-130	Pass	
Nickel	S18-Ma07468	NCP	%	79			70-130	Pass	
Zinc	S18-Ma07468	NCP	%	75			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4,4'-DDD	S18-Ma06265	NCP	%	128			70-130	Pass	
4,4'-DDE	S18-Ma07468	NCP	%	115			70-130	Pass	
4,4'-DDT	S18-Ma04405	NCP	%	128			70-130	Pass	
a-BHC	S18-Ma07468	NCP	%	106			70-130	Pass	
Aldrin	S18-Ma07468	NCP	%	112			70-130	Pass	
b-BHC	S18-Ma07468	NCP	%	96			70-130	Pass	
d-BHC	S18-Ma07468	NCP	%	104			70-130	Pass	
Dieldrin	S18-Ma06265	NCP	%	120			70-130	Pass	
Endosulfan I	S18-Ma07468	NCP	%	109			70-130	Pass	
Endosulfan II	S18-Ma07468	NCP	%	107			70-130	Pass	
Endosulfan sulphate	S18-Ma07468	NCP	%	113			70-130	Pass	
Endrin	S18-Ma07468	NCP	%	111			70-130	Pass	
Endrin aldehyde	S18-Ma07468	NCP	%	96			70-130	Pass	
Endrin ketone	S18-Ma07468	NCP	%	119			70-130	Pass	
g-BHC (Lindane)	S18-Ma07468	NCP	%	103			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Heptachlor	S18-Ma07468	NCP	%	91			70-130	Pass	
Heptachlor epoxide	S18-Ma07468	NCP	%	117			70-130	Pass	
Hexachlorobenzene	S18-Ma07468	NCP	%	105			70-130	Pass	
Methoxychlor	S18-Ma06265	NCP	%	72			70-130	Pass	
Toxaphene	S18-Ma05100	NCP	%	96			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	S18-Ma07468	NCP	%	113			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	S18-Ma09949	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S18-Ma07467	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S18-Ma07467	NCP	mg/kg	96	110	16	30%	Pass	
TRH C29-C36	S18-Ma07467	NCP	mg/kg	140	170	18	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S18-Ma09949	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S18-Ma09949	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S18-Ma09949	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S18-Ma09949	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S18-Ma09949	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S18-Ma09949	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S18-Ma09949	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S18-Ma09949	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S18-Ma07467	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S18-Ma07467	NCP	mg/kg	180	210	16	30%	Pass	
TRH >C34-C40	S18-Ma07467	NCP	mg/kg	120	160	27	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S18-Ma01654	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S18-Ma01654	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S18-Ma01654	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S18-Ma01654	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S18-Ma01654	NCP	mg/kg	< 0.5	0.6	120	30%	Fail	Q15
Benzo(b&j)fluoranthene	S18-Ma01654	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g,h,i)perylene	S18-Ma01654	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Benzo(k)fluoranthene	S18-Ma01654	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S18-Ma01654	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a,h)anthracene	S18-Ma01654	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S18-Ma01654	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S18-Ma01654	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1,2,3-cd)pyrene	S18-Ma01654	NCP	mg/kg	< 0.5	0.5	120	30%	Fail	Q15
Naphthalene	S18-Ma01654	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S18-Ma01654	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S18-Ma01654	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S18-Ma07467	NCP	mg/kg	8.2	8.6	5.0	30%	Pass	
Cadmium	S18-Ma07467	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S18-Ma07467	NCP	mg/kg	29	30	4.0	30%	Pass	
Copper	S18-Ma07467	NCP	mg/kg	31	32	3.0	30%	Pass	

Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Lead	S18-Ma07467	NCP	mg/kg	70	72	3.0	30%	Pass
Mercury	S18-Ma06259	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Nickel	S18-Ma07467	NCP	mg/kg	32	34	5.0	30%	Pass
Zinc	S18-Ma07467	NCP	mg/kg	83	88	6.0	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	S18-Ma01654	NCP	%	8.2	8.6	5.0	30%	Pass
Duplicate								
Organochlorine Pesticides				Result 1	Result 2	RPD		
Chlordanes - Total	S18-Ma04176	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
4,4'-DDD	S18-Ma04176	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4,4'-DDE	S18-Ma04176	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4,4'-DDT	S18-Ma04176	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
a-BHC	S18-Ma04176	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Aldrin	S18-Ma04176	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
b-BHC	S18-Ma04176	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
d-BHC	S18-Ma04176	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Dieldrin	S18-Ma04176	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan I	S18-Ma04176	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan II	S18-Ma04176	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan sulphate	S18-Ma04176	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin	S18-Ma04176	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin aldehyde	S18-Ma04176	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin ketone	S18-Ma04176	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
g-BHC (Lindane)	S18-Ma04176	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor	S18-Ma04176	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor epoxide	S18-Ma04176	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Hexachlorobenzene	S18-Ma04176	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Methoxychlor	S18-Ma04176	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Toxaphene	S18-Ma04176	CP	mg/kg	< 1	< 1	<1	30%	Pass
Duplicate								
Polychlorinated Biphenyls				Result 1	Result 2	RPD		
Aroclor-1016	S18-Ma04176	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1221	S18-Ma04176	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1232	S18-Ma04176	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1242	S18-Ma04176	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1248	S18-Ma04176	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1254	S18-Ma04176	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1260	S18-Ma04176	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass

Comments

Sample Integrity

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

Comments

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
Q15	The RPD reported passes Eurofins mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Nibha Vaidya Analytical Services Manager



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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Certificate of Analysis

Coffey Environments Pty Ltd NSW
Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Simon Hay

Report 587720-W
Project name MANN ST GOSFORD
Project ID SYDGE214942
Received Date Mar 05, 2018

Client Sample ID			R4
Sample Matrix			Water
Eurofins mgt Sample No.			S18-Ma04178
Date Sampled			Mar 02, 2018
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	0.02	mg/L	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1
TRH C10-36 (Total)	0.1	mg/L	< 0.1
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003
4-Bromofluorobenzene (surr.)	1	%	65
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene ^{N02}	0.01	mg/L	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1
Polycyclic Aromatic Hydrocarbons			
Acenaphthene	0.001	mg/L	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001
Anthracene	0.001	mg/L	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001
Chrysene	0.001	mg/L	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001
Fluoranthene	0.001	mg/L	< 0.001
Fluorene	0.001	mg/L	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001

Client Sample ID			R4
Sample Matrix			Water
Eurofins mgt Sample No.			S18-Ma04178
Date Sampled			Mar 02, 2018
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Naphthalene	0.001	mg/L	< 0.001
Phenanthrene	0.001	mg/L	< 0.001
Pyrene	0.001	mg/L	< 0.001
Total PAH*	0.001	mg/L	< 0.001
2-Fluorobiphenyl (surr.)	1	%	80
p-Terphenyl-d14 (surr.)	1	%	93
Organochlorine Pesticides			
Chlordanes - Total	0.001	mg/L	< 0.001
4,4'-DDD	0.0001	mg/L	< 0.0001
4,4'-DDE	0.0001	mg/L	< 0.0001
4,4'-DDT	0.0001	mg/L	< 0.0001
α-BHC	0.0001	mg/L	< 0.0001
Aldrin	0.0001	mg/L	< 0.0001
β-BHC	0.0001	mg/L	< 0.0001
δ-BHC	0.0001	mg/L	< 0.0001
Dieldrin	0.0001	mg/L	< 0.0001
Endosulfan I	0.0001	mg/L	< 0.0001
Endosulfan II	0.0001	mg/L	< 0.0001
Endosulfan sulphate	0.0001	mg/L	< 0.0001
Endrin	0.0001	mg/L	< 0.0001
Endrin aldehyde	0.0001	mg/L	< 0.0001
Endrin ketone	0.0001	mg/L	< 0.0001
γ-BHC (Lindane)	0.0001	mg/L	< 0.0001
Heptachlor	0.0001	mg/L	< 0.0001
Heptachlor epoxide	0.0001	mg/L	< 0.0001
Hexachlorobenzene	0.0001	mg/L	< 0.0001
Methoxychlor	0.0001	mg/L	< 0.0001
Toxaphene	0.01	mg/L	< 0.01
Aldrin and Dieldrin (Total)*	0.0001	mg/L	< 0.0001
DDT + DDE + DDD (Total)*	0.0001	mg/L	< 0.0001
Vic EPA IWRG 621 OCP (Total)*	0.001	mg/L	< 0.001
Vic EPA IWRG 621 Other OCP (Total)*	0.001	mg/L	< 0.001
Dibutylchloroendate (surr.)	1	%	INT
Tetrachloro-m-xylene (surr.)	1	%	INT
Polychlorinated Biphenyls			
Aroclor-1016	0.005	mg/L	< 0.005
Aroclor-1221	0.001	mg/L	< 0.001
Aroclor-1232	0.005	mg/L	< 0.005
Aroclor-1242	0.005	mg/L	< 0.005
Aroclor-1248	0.005	mg/L	< 0.005
Aroclor-1254	0.005	mg/L	< 0.005
Aroclor-1260	0.005	mg/L	< 0.005
Total PCB*	0.001	mg/L	< 0.001
Dibutylchloroendate (surr.)	1	%	INT
Tetrachloro-m-xylene (surr.)	1	%	INT

Client Sample ID			R4
Sample Matrix			Water
Eurofins mgt Sample No.			S18-Ma04178
Date Sampled			Mar 02, 2018
Test/Reference	LOR	Unit	
Heavy Metals			
Arsenic	0.001	mg/L	< 0.001
Cadmium	0.0002	mg/L	< 0.0002
Chromium	0.001	mg/L	0.006
Copper	0.001	mg/L	0.002
Lead	0.001	mg/L	< 0.001
Mercury	0.0001	mg/L	< 0.0001
Nickel	0.001	mg/L	0.002
Zinc	0.005	mg/L	0.027

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 (regarding both quality and NATA accreditation).

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 mgt Suite B4			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Mar 05, 2018	7 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Mar 05, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Mar 05, 2018	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Mar 12, 2018	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Sydney	Mar 05, 2018	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Water by GCMS			
Organochlorine Pesticides	Sydney	Mar 05, 2018	7 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Sydney	Mar 05, 2018	7 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Metals M8	Sydney	Mar 12, 2018	28 Day
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Project Name: MANN ST GOSFORD
Project ID: SYDGE214942

Order No.:
Report #: 587720
Phone: +61 2 9406 1000
Fax: +61 2 9406 1004

Received: Mar 5, 2018 11:37 AM
Due: Mar 12, 2018
Priority: 5 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Metals M8	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
External Laboratory										
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID					
1	BH6 (0-0.3M)	Mar 01, 2018		Soil	S18-Ma04174		X		X	X
2	BH6 (0.8-1.0M)	Mar 01, 2018		Soil	S18-Ma04175		X		X	X
3	BH7 (0-0.5M)	Mar 02, 2018		Soil	S18-Ma04176		X	X	X	X
4	BH7 (1.5-2.0M)	Mar 02, 2018		Soil	S18-Ma04177		X		X	X
5	R4	Mar 02, 2018		Water	S18-Ma04178		X	X		X
6	DUP5	Mar 02, 2018		Soil	S18-Ma04179	X				
7	BH6 (1.6-2.0M)	Mar 01, 2018		Soil	S18-Ma04180	X				

Company Name: Coffey Environments Pty Ltd NSW
Address: Level 20, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: MANN ST GOSFORD
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Order No.:
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Received: Mar 5, 2018 11:37 AM
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Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Metals M8	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
8	BH6 (2.4-2.7M)	Mar 01, 2018		Soil	S18-Ma04181	X				
9	BH7 (2.5-2.7M)	Mar 02, 2018		Soil	S18-Ma04182	X				
10	BH7 (2.8-3.0M)	Mar 02, 2018		Soil	S18-Ma04183	X				
Test Counts						5	5	2	4	5

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota 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. 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	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NC	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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. 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/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g,h,i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a,h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1,2,3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/L	< 0.001			0.001	Pass	
4,4'-DDD	mg/L	< 0.0001			0.0001	Pass	
4,4'-DDE	mg/L	< 0.0001			0.0001	Pass	
4,4'-DDT	mg/L	< 0.0001			0.0001	Pass	
a-BHC	mg/L	< 0.0001			0.0001	Pass	
Aldrin	mg/L	< 0.0001			0.0001	Pass	
b-BHC	mg/L	< 0.0001			0.0001	Pass	
d-BHC	mg/L	< 0.0001			0.0001	Pass	
Dieldrin	mg/L	< 0.0001			0.0001	Pass	
Endosulfan I	mg/L	< 0.0001			0.0001	Pass	
Endosulfan II	mg/L	< 0.0001			0.0001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/L	< 0.0001			0.0001	Pass	
Endrin	mg/L	< 0.0001			0.0001	Pass	
Endrin aldehyde	mg/L	< 0.0001			0.0001	Pass	
Endrin ketone	mg/L	< 0.0001			0.0001	Pass	
g-BHC (Lindane)	mg/L	< 0.0001			0.0001	Pass	
Heptachlor	mg/L	< 0.0001			0.0001	Pass	
Heptachlor epoxide	mg/L	< 0.0001			0.0001	Pass	
Hexachlorobenzene	mg/L	< 0.0001			0.0001	Pass	
Methoxychlor	mg/L	< 0.0001			0.0001	Pass	
Toxaphene	mg/L	< 0.01			0.01	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/L	< 0.005			0.005	Pass	
Aroclor-1221	mg/L	< 0.001			0.001	Pass	
Aroclor-1232	mg/L	< 0.005			0.005	Pass	
Aroclor-1242	mg/L	< 0.005			0.005	Pass	
Aroclor-1248	mg/L	< 0.005			0.005	Pass	
Aroclor-1254	mg/L	< 0.005			0.005	Pass	
Aroclor-1260	mg/L	< 0.005			0.005	Pass	
Total PCB*	mg/L	< 0.001			0.001	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	85			70-130	Pass	
TRH C10-C14	%	114			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	81			70-130	Pass	
Toluene	%	91			70-130	Pass	
Ethylbenzene	%	88			70-130	Pass	
m&p-Xylenes	%	96			70-130	Pass	
o-Xylene	%	95			70-130	Pass	
Xylenes - Total	%	96			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	100			70-130	Pass	
TRH C6-C10	%	91			70-130	Pass	
TRH >C10-C16	%	119			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	91			70-130	Pass	
Acenaphthylene	%	104			70-130	Pass	
Anthracene	%	108			70-130	Pass	
Benz(a)anthracene	%	98			70-130	Pass	
Benzo(a)pyrene	%	105			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(b&j)fluoranthene			%	104			70-130	Pass	
Benzo(g,h,i)perylene			%	109			70-130	Pass	
Benzo(k)fluoranthene			%	115			70-130	Pass	
Chrysene			%	101			70-130	Pass	
Dibenz(a,h)anthracene			%	109			70-130	Pass	
Fluoranthene			%	102			70-130	Pass	
Fluorene			%	101			70-130	Pass	
Indeno(1,2,3-cd)pyrene			%	109			70-130	Pass	
Naphthalene			%	100			70-130	Pass	
Phenanthrene			%	106			70-130	Pass	
Pyrene			%	102			70-130	Pass	
LCS - % Recovery									
Organochlorine Pesticides									
4,4'-DDD			%	80			70-130	Pass	
4,4'-DDE			%	90			70-130	Pass	
4,4'-DDT			%	90			70-130	Pass	
a-BHC			%	80			70-130	Pass	
Aldrin			%	70			70-130	Pass	
b-BHC			%	80			70-130	Pass	
d-BHC			%	80			70-130	Pass	
Dieldrin			%	80			70-130	Pass	
Endosulfan I			%	80			70-130	Pass	
Endosulfan II			%	80			70-130	Pass	
Endosulfan sulphate			%	80			70-130	Pass	
Endrin			%	90			70-130	Pass	
Endrin aldehyde			%	80			70-130	Pass	
Endrin ketone			%	90			70-130	Pass	
g-BHC (Lindane)			%	80			70-130	Pass	
Heptachlor			%	70			70-130	Pass	
Heptachlor epoxide			%	80			70-130	Pass	
Hexachlorobenzene			%	71			70-130	Pass	
Methoxychlor			%	90			70-130	Pass	
LCS - % Recovery									
Polychlorinated Biphenyls									
Aroclor-1260			%	86			70-130	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic			%	105			70-130	Pass	
Cadmium			%	111			70-130	Pass	
Chromium			%	109			70-130	Pass	
Copper			%	115			70-130	Pass	
Lead			%	116			70-130	Pass	
Mercury			%	117			70-130	Pass	
Nickel			%	111			70-130	Pass	
Zinc			%	108			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals									
				Result 1					
Arsenic	S18-Ma11030	NCP	%	125			70-130	Pass	
Cadmium	S18-Ma11030	NCP	%	104			70-130	Pass	
Chromium	S18-Ma11030	NCP	%	125			70-130	Pass	
Copper	S18-Ma11030	NCP	%	126			70-130	Pass	
Lead	S18-Ma11030	NCP	%	105			70-130	Pass	
Mercury	S18-Ma11030	NCP	%	109			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Nickel	S18-Ma11030	NCP	%	100			70-130	Pass	
Zinc	S18-Ma11030	NCP	%	97			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	S18-Fe33470	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S18-Fe33470	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S18-Fe33470	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S18-Fe33470	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S18-Fe33470	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S18-Fe33470	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	S18-Fe33470	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S18-Fe33470	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	S18-Fe33470	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S18-Ma11029	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium	S18-Ma11029	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	S18-Ma11029	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	S18-Ma11029	NCP	mg/L	0.004	0.004	8.0	30%	Pass	
Lead	S18-Ma11029	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Nickel	S18-Ma11029	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc	S18-Ma11029	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	

Comments

Sample Integrity

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

Comments

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

Authorised By

Nibha Vaidya Analytical Services Manager



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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coffey environments SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE		Consigning Office: Chatswood		Report Results to: Simon Hay		Mobile:		Email: simon.hay@coffey.com											
		Invoices to: Simon Hay				Phone: 0427 643 063		Email: luke.steller@coffey.com											
Project No: SYDGE214942 Task No:				Analysis Request Section															
Project Name: Mann St Gosford Laboratory: Eurofins				NOTES															
Sampler's Name: Lily Project Manager: Simon Hay																			
Special Instructions:																			
Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	Suite B4 (TRH, BTEX, PAH)	Suite M8	Suite B13 OCP, PCB	pH Fieldscreen pHf, pHfox	SPOCAS	TRH (C6-C10) & BTEX	Asbestos	Hold					
	BH8 0.0-1.0m	6/03/2018		Soil			X	X	X										
	BH8 1.0-1.5m	6/03/2018		Soil										X					
	BH8 1.6-2.0m	6/03/2018		Soil			X	X		X									
	BH8 2.8-3.0m	6/03/2018		Soil						X									
	BH9 0.0-1.1m	6/03/2018		Soil			X	X	X										
	BH9 1.1-1.8m	6/03/2018		Soil			X	X		X									
	BH9 1.8-2.1m	6/03/2018		Soil						X									
	BH9 2.6-3.0m	6/03/2018		Soil						X									
	DUP6	6/03/2018		Soil			X	X	X										
	DUP7	6/03/2018		Soil			X	X	X										
	TRIP5	6/03/2018		Soil			X	X	X										
	TRIP6	6/03/2018		Soil			X	X	X										
RELINQUISHED BY				RECEIVED BY				Sample Receipt Advice: (Lab Use Only)											
Name:		Date: 7/03/2018		Name: RP Williams		Date: 7/3/18		All Samples Received in Good Condition ☒											
Coffey Environments		Time:		Company: Eurofins		Time: 15:51		All Documentation is in Proper Order ☒											
Name:		Date:		Name:		Date:		Samples Received Properly Chilled ☒											
Company:		Time:		Company:		Time:		Lab. Ref/Batch No. 588250 588251											
*Container Type & Preservation Codes: P - Plastic, G- Glass Bottle, J - Glass Jar, V- Vial, Z - Ziplock bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative																			

Sample Receipt Advice

Company name: **Coffey Geotechnics Pty Ltd Chatswood**

Contact name: SIMON HAY
Project name: MANN ST GOSFORD
Project ID: SYDGE214942
COC number: Not provided
Turn around time: 1 Day
Date/Time received: Mar 7, 2018 3:51 PM
Eurofins | mgt reference: **588250**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 19.8 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to SIMON HAY - simon.hay@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Geotechnics Pty Ltd Chatswood email address.

Certificate of Analysis

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: **Simon Hay**

Report **588250-S**
Project name MANN ST GOSFORD
Project ID SYDGE214942
Received Date Mar 07, 2018

Client Sample ID			BH8 1.6-2.0M	BH8 2.8-3.0M	BH9 1.1-1.8M	BH9 1.8-2.1M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Ma07749	S18-Ma07750	S18-Ma07751	S18-Ma07752
Date Sampled			Mar 06, 2018	Mar 06, 2018	Mar 06, 2018	Mar 06, 2018
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.2	6.3	6.8	7.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.1	5.0	3.4	3.5
Reaction Ratings* ^{S05}		comment	4.0	4.0	3.0	4.0

Client Sample ID			BH9 2.6-3.0M
Sample Matrix			Soil
Eurofins mgt Sample No.			S18-Ma07753
Date Sampled			Mar 06, 2018
Test/Reference	LOR	Unit	
Acid Sulfate Soils Field pH Test			
pH-F (Field pH test)*	0.1	pH Units	6.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.6
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 (regarding both quality and NATA accreditation).

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

Acid Sulfate Soils Field pH Test

Testing Site

Sydney

Extracted

Mar 08, 2018

Holding Time

7 Days

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

Company Name: Coffey Geotechnics Pty Ltd Chatswood
Address: Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Project Name: MANN ST GOSFORD
Project ID: SYDGE214942

Order No.:
Report #: 588250
Phone: +61 2 9406 1000
Fax: +61 2 9406 1002

Received: Mar 7, 2018 3:51 PM
Due: Mar 8, 2018
Priority: 1 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	BH8 1.6-2.0M	Mar 06, 2018		Soil	S18-Ma07749		X
2	BH8 2.8-3.0M	Mar 06, 2018		Soil	S18-Ma07750		X
3	BH9 1.1-1.8M	Mar 06, 2018		Soil	S18-Ma07751		X
4	BH9 1.8-2.1M	Mar 06, 2018		Soil	S18-Ma07752		X
5	BH9 2.6-3.0M	Mar 06, 2018		Soil	S18-Ma07753		X
6	BH8 0.0-1.0M	Mar 06, 2018		Soil	S18-Ma07754	X	
7	BH8 1.0-1.5M	Mar 06, 2018		Soil	S18-Ma07755	X	
8	BH9 0.0-1.1M	Mar 06, 2018		Soil	S18-Ma07756	X	
9	DUP6	Mar 06, 2018		Soil	S18-Ma07757	X	

Company Name: Coffey Geotechnics Pty Ltd Chatswood
Address: Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: MANN ST GOSFORD
Project ID: SYDGE214942

Order No.:
Report #: 588250
Phone: +61 2 9406 1000
Fax: +61 2 9406 1002

Received: Mar 7, 2018 3:51 PM
Due: Mar 8, 2018
Priority: 1 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
10	DUP7	Mar 06, 2018		Soil	S18-Ma07758	X	
11	TRIP5	Mar 06, 2018		Soil	S18-Ma07759	X	
12	TRIP6	Mar 06, 2018		Soil	S18-Ma07760	X	
Test Counts						7	5

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota 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. 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	Quality Systems Manual ver 5.1 US Department of Defense
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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. 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.

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

Comments

Qualifier Codes/Comments

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

Authorised By

Nibha Vaidya Analytical Services Manager



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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COC NSW

From: Asim Khan
Sent: Wednesday, 14 March 2018 12:30 PM
To: Enviro Sample NSW; COC NSW
Cc: Nibha Vaidya
Subject: 5 dat TAT addition analysis FW: Eurofins | mgt Test Results - Report 588250 : Site MANN ST GOSFORD (SYDGE214942)
Attachments: 588250-S_report.pdf; 588250_COC.PDF

Additional analysis please on 5 day TAT

- SPOCAS - sample BH9_1.8-2.1 (S18-Ma07752)

Thanks
Kind regards,

Asim Khan
Analytical Services Manager

Eurofins | mgt
Phone : +61 2 9900 8432
Email : AsimKhan@eurofins.com
Website : www.eurofins.com.au/environmental-testing

From: Hay, Simon [<mailto:Simon.Hay@coffey.com>]
Sent: Tuesday, 13 March 2018 12:36 PM
To: Asim Khan
Cc: Steller, Luke
Subject: RE: Eurofins | mgt Test Results - Report 588250 : Site MANN ST GOSFORD (SYDGE214942)

EXTERNAL EMAIL*

Hi Asim, how are you?

Could I please undertake SPOCAS sampling on sample BH9_1.8-2.1 on a 5 day TAT please?

Kind Regards

Simon

From: AsimKhan@eurofins.com [<mailto:AsimKhan@eurofins.com>]
Sent: Thursday, March 8, 2018 6:21 PM
To: Hay, Simon <Simon.Hay@coffey.com>
Cc: Steller, Luke <Luke.Steller@coffey.com>
Subject: Eurofins | mgt Test Results - Report 588250 : Site MANN ST GOSFORD (SYDGE214942)

Dear Simon,

Please find attached results for your project in the subject header.

Kind regards,

Asim Khan
Analytical Services Manager

Eurofins | mgt

Unit F3, Parkview Building
16 Mars Road
LANE COVE WEST NSW 2066
AUSTRALIA

Phone : +61 2 9900 8432

Email : AsimKhan@eurofins.com

Website : www.eurofins.com.au/environmental-testing

[EnviroNote 1076 - PFAS Biota](#)

[EnviroNote 1074 - Passive Samplers for VOCs in Air](#)

Click [here](#) to report this email as spam.

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Sample Receipt Advice

Company name: **Coffey Geotechnics Pty Ltd Chatswood**
Contact name: Simon Hay
Project name: ADDITIONAL - MANN ST GOSFORD
Project ID: SYDGE214942
COC number: Not provided
Turn around time: 5 Day
Date/Time received: Mar 13, 2018 12:36 PM
Eurofins | mgt reference: **589171**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 19.8 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Simon Hay - simon.hay@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Geotechnics Pty Ltd Chatswood email address.

Certificate of Analysis

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Simon Hay

Report 589171-S
Project name ADDITIONAL - MANN ST GOSFORD
Project ID SYDGE214942
Received Date Mar 13, 2018

Client Sample ID			BH9 1.8-2.1M
Sample Matrix			Soil
Eurofins mgt Sample No.			S18-Ma15147
Date Sampled			Mar 06, 2018
Test/Reference	LOR	Unit	
SPOCAS Suite			
pH-KCL	0.1	pH Units	8.8
pH-OX	0.1	pH Units	7.4
Acid trail - Titratable Actual Acidity	2	mol H+/t	< 2
Acid trail - Titratable Peroxide Acidity	2	mol H+/t	< 2
Acid trail - Titratable Sulfidic Acidity	2	mol H+/t	< 2
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	< 0.02
sulfidic - TPA equiv. S% pyrite	0.02	% pyrite S	< 0.02
sulfidic - TSA equiv. S% pyrite	0.02	% pyrite S	< 0.02
Sulfur - KCl Extractable	0.02	% S	< 0.02
Sulfur - Peroxide	0.02	% S	< 0.02
Sulfur - Peroxide Oxidisable Sulfur	0.02	% S	< 0.02
acidity - Peroxide Oxidisable Sulfur	10	mol H+/t	< 10
HCl Extractable Sulfur	0.02	% S	n/a
Net Acid soluble sulfur	0.02	% S	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a
Net Acid soluble sulfur - equivalent S% pyrite ^{S02}	0.02	% S	n/a
Calcium - KCl Extractable	0.02	% Ca	0.26
Calcium - Peroxide	0.02	% Ca	0.35
Acid Reacted Calcium	0.02	% Ca	0.10
acidity - Acid Reacted Calcium	10	mol H+/t	49
sulfidic - Acid Reacted Ca equiv. S% pyrite	0.02	% S	0.08
Magnesium - KCl Extractable	0.02	% Mg	< 0.02
Magnesium - Peroxide	0.02	% Mg	< 0.02
Acid Reacted Magnesium	0.02	% Mg	< 0.02
acidity - Acid Reacted Magnesium	10	mol H+/t	< 10
sulfidic - Acid Reacted Mg equiv. S% pyrite	0.02	% S	< 0.02
Acid Neutralising Capacity (ANCE)	0.02	%CaCO ₃	0.46
Acid Neutralising Capacity - Acidity units (a-ANCE)	10	mol H+/t	92
Acid Neutralising Capacity - equivalent S% pyrite(s-ANCE)	0.02	% S	0.15
ANC Fineness Factor		factor	1.5
SPOCAS - Net Acidity (Sulfur Units)	0.02	% S	< 0.02
SPOCAS - Net Acidity (Acidity Units)	10	mol H+/t	< 10
SPOCAS - Liming rate	1	kg CaCO ₃ /t	< 1

Client Sample ID			BH9 1.8-2.1M
Sample Matrix			Soil
Eurofins mgt Sample No.			S18-Ma15147
Date Sampled			Mar 06, 2018
Test/Reference	LOR	Unit	
Extraneous Material			
<2mm Fraction	0.005	g	4.2
>2mm Fraction	0.005	g	1.0
Analysed Material	0.1	%	80
Extraneous Material	0.1	%	20
% Moisture	1	%	16

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 (regarding both quality and NATA accreditation).

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			
SPOCAS Suite	Brisbane	Mar 16, 2018	6 Week
- Method: LTM-GEN-7050			
Extraneous Material	Brisbane	Mar 16, 2018	6 Week
- Method: LTM-GEN-7050/7070			
% Moisture	Brisbane	Mar 14, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name: Coffey Geotechnics Pty Ltd Chatswood
Address: Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: ADDITIONAL - MANN ST GOSFORD
Project ID: SYDGE214942

Order No.:
Report #: 589171
Phone: +61 2 9406 1000
Fax: +61 2 9406 1002

Received: Mar 13, 2018 12:36 PM
Due: Mar 20, 2018
Priority: 5 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						SPOCAS Suite	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794						X	X
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	BH9 1.8-2.1M	Mar 06, 2018		Soil	S18-Ma15147	X	X
Test Counts						1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota 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. 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	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NC	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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

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

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
SPOCAS Suite				Result 1	Result 2	RPD			
pH-KCL	M18-Ma14784	NCP	pH Units	7.2	7.2	<1	30%	Pass	
pH-OX	M18-Ma14784	NCP	pH Units	6.6	6.6	<1	30%	Pass	
Acid trail - Titratable Actual Acidity	M18-Ma14784	NCP	mol H+/t	< 2	< 2	<1	30%	Pass	
Acid trail - Titratable Peroxide Acidity	M18-Ma14784	NCP	mol H+/t	< 2	< 2	<1	30%	Pass	
Acid trail - Titratable Sulfidic Acidity	M18-Ma14784	NCP	mol H+/t	< 2	< 2	<1	30%	Pass	
sulfidic - TAA equiv. S% pyrite	M18-Ma14784	NCP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
sulfidic - TPA equiv. S% pyrite	M18-Ma14784	NCP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
sulfidic - TSA equiv. S% pyrite	M18-Ma14784	NCP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - KCl Extractable	M18-Ma14784	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - Peroxide	M18-Ma14784	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - Peroxide Oxidisable Sulfur	M18-Ma14784	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
acidity - Peroxide Oxidisable Sulfur	M18-Ma14784	NCP	mol H+/t	< 10	< 10	<1	30%	Pass	
HCl Extractable Sulfur	M18-Ma14784	NCP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur	M18-Ma14784	NCP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - acidity units	M18-Ma14784	NCP	mol H+/t	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	M18-Ma14784	NCP	% S	n/a	n/a	n/a	30%	Pass	
Calcium - KCl Extractable	M18-Ma14784	NCP	% Ca	0.02	0.02	3.0	30%	Pass	
Calcium - Peroxide	M18-Ma14784	NCP	% Ca	0.02	0.03	14	30%	Pass	
Acid Reacted Calcium	M18-Ma14784	NCP	% Ca	< 0.02	< 0.02	<1	30%	Pass	
acidity - Acid Reacted Calcium	M18-Ma14784	NCP	mol H+/t	< 10	< 10	<1	30%	Pass	
sulfidic - Acid Reacted Ca equiv. S% pyrite	M18-Ma14784	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Magnesium - KCl Extractable	M18-Ma14784	NCP	% Mg	0.02	0.02	6.0	30%	Pass	
Magnesium - Peroxide	M18-Ma14784	NCP	% Mg	0.03	0.03	6.0	30%	Pass	
Acid Reacted Magnesium	M18-Ma14784	NCP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
acidity - Acid Reacted Magnesium	M18-Ma14784	NCP	mol H+/t	< 10	< 10	<1	30%	Pass	
sulfidic - Acid Reacted Mg equiv. S% pyrite	M18-Ma14784	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
Acid Neutralising Capacity (ANCE)	M18-Ma14784	NCP	%CaCO3	0.08	0.09	10	30%	Pass	
Acid Neutralising Capacity - Acidity units (a-ANCE)	M18-Ma14784	NCP	mol H+/t	17	18	10	30%	Pass	
ANC Fineness Factor	M18-Ma14784	NCP	factor	1.5	1.5	<1	30%	Pass	
SPOCAS - Liming rate	M18-Ma14784	NCP	kg CaCO3/t	< 1	< 1	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S18-Ma15147	CP	%	16	17	7.0	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5

Authorised By

Nibha Vaidya	Analytical Services Manager
Myles Clark	Senior Analyst-Metal (QLD)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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environments SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE		Consigning Office: Chatswood		Report Results to: Simon Hay		Mobile: _____		Email: simon.hay@coffey.com											
		Invoices to: Simon Hay		Phone: 0427 643 063		Email: luke.steller@coffey.com													
Project No: SYDGE214942		Task No: _____		Analysis Request Section															
Project Name: Mann St Gosford		Laboratory: Eurofins																	
Sampler's Name: Lily		Project Manager: Simon Hay		NOTES															
Special Instructions: _____		_____																	
Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	Suite B4 (TRH, BTEX, PAH)	Suite M8	Suite B13 OCP, PCB	pH Fieldscreen pHf, pHfox	SPOCAS	TRH (C6-C10) & BTEX	Asbestos	Hold					
	BH8 0.0-1.0m	6/03/2018		Soil			X	X	X										
	BH8 1.0-1.5m	6/03/2018		Soil										X					
	BH8 1.6-2.0m	6/03/2018		Soil			X	X		X									
	BH8 2.8-3.0m	6/03/2018		Soil						X									
	BH9 0.0-1.1m	6/03/2018		Soil			X	X	X										
	BH9 1.1-1.8m	6/03/2018		Soil			X	X		X									
	BH9 1.8-2.1m	6/03/2018		Soil						X									
	BH9 2.6-3.0m	6/03/2018		Soil						X									
	DUP6	6/03/2018		Soil			X	X	X										
	DUP7	6/03/2018		Soil			X	X	X										
	TRIP5	6/03/2018		Soil			X	X	X										
	TRIP6	6/03/2018		Soil			X	X	X										
RELINQUISHED BY				RECEIVED BY				Sample Receipt Advice: (Lab Use Only)											
Name: _____		Date: 7/03/2018		Name: RPMU/113		Date: 7/3/18		All Samples Recieved in Good Condition ☒ All Documentation is in Proper Order ☒ Samples Received Properly Chilled ☒ Lab. Ref/Batch No. 588250 588251											
Coffey Environments		Time: _____		Company: Blundis		Time: 15:51													
Name: _____		Date: _____		Name: _____		Date: _____													
Company: _____		Time: _____		Company: _____		Time: _____													
*Container Type & Preservation Codes: P - Plastic, G- Glass Bottle, J - Glass Jar, V- Vial, Z - Ziplock bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative																			

Sample Receipt Advice

Company name: **Coffey Geotechnics Pty Ltd Chatswood**
Contact name: **SIMON HAY**
Project name: **MANN ST GOSFORD**
Project ID: **SYDGE214942**
COC number: **Not provided**
Turn around time: **5 Day**
Date/Time received: **Mar 7, 2018 3:51 PM**
Eurofins | mgt reference: **588255**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 18.6 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to SIMON HAY - simon.hay@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Geotechnics Pty Ltd Chatswood email address.

Certificate of Analysis

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Simon Hay

Report 588255-S
Project name MANN ST GOSFORD
Project ID SYDGE214942
Received Date Mar 07, 2018

Client Sample ID			BH8 0.0-1.0M	BH8 1.6-2.0M	BH9 0.0-1.1M	BH9 1.1-1.8M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Ma07808	S18-Ma07809	S18-Ma07810	S18-Ma07811
Date Sampled			Mar 06, 2018	Mar 06, 2018	Mar 06, 2018	Mar 06, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	97	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	97	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	66	74	75	80
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	120	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	5.3	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	5.3	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	5.3	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	2.7	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	3.2	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	2.1	< 0.5	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	3.2	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	2.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	2.9	< 0.5	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	1.0	< 0.5	< 0.5	< 0.5

Client Sample ID			BH8 0.0-1.0M	BH8 1.6-2.0M	BH9 0.0-1.1M	BH9 1.1-1.8M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Ma07808	S18-Ma07809	S18-Ma07810	S18-Ma07811
Date Sampled			Mar 06, 2018	Mar 06, 2018	Mar 06, 2018	Mar 06, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluoranthene	0.5	mg/kg	6.6	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	2.6	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	2.2	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	5.8	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	34.8	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	98	56	102	111
p-Terphenyl-d14 (surr.)	1	%	90	58	108	112
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	-
α-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
β-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
δ-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	-
γ-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	-
Toxaphene	1	mg/kg	< 1	-	< 1	-
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	-
Dibutylchloroendate (surr.)	1	%	104	-	80	-
Tetrachloro-m-xylene (surr.)	1	%	92	-	78	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1232	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1242	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1248	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1254	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1260	0.1	mg/kg	< 0.1	-	< 0.1	-
Total PCB*	0.1	mg/kg	< 0.1	-	< 0.1	-
Dibutylchloroendate (surr.)	1	%	104	-	80	-
Tetrachloro-m-xylene (surr.)	1	%	92	-	78	-

Client Sample ID			BH8 0.0-1.0M Soil	BH8 1.6-2.0M Soil	BH9 0.0-1.1M Soil	BH9 1.1-1.8M Soil
Sample Matrix			S18-Ma07808	S18-Ma07809	S18-Ma07810	S18-Ma07811
Eurofins mgt Sample No.			Mar 06, 2018	Mar 06, 2018	Mar 06, 2018	Mar 06, 2018
Date Sampled						
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	4.1	< 2	3.8	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	12	7.0	9.8	< 5
Copper	5	mg/kg	13	< 5	8.9	< 5
Lead	5	mg/kg	70	6.0	27	< 5
Mercury	0.1	mg/kg	0.3	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	11	< 5
Zinc	5	mg/kg	99	< 5	80	15
% Moisture	1	%	17	14	11	9.4

Client Sample ID			DUP6 Soil	DUP7 Soil	TRIP5 Soil	TRIP6 Soil
Sample Matrix			S18-Ma07812	S18-Ma07813	S18-Ma07814	S18-Ma07815
Eurofins mgt Sample No.			Mar 06, 2018	Mar 06, 2018	Mar 06, 2018	Mar 06, 2018
Date Sampled						
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	82	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	82	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	66	69	71	66
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	0.9	< 0.5	5.2	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	1.3	0.6	5.2	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.6	1.2	5.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	2.4	< 0.5
Benzo(a)pyrene	0.5	mg/kg	0.9	< 0.5	3.1	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	< 0.5	2.7	< 0.5

Client Sample ID			DUP6	DUP7	TRIP5	TRIP6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Ma07812	S18-Ma07813	S18-Ma07814	S18-Ma07815
Date Sampled			Mar 06, 2018	Mar 06, 2018	Mar 06, 2018	Mar 06, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(g,h,i)perylene	0.5	mg/kg	0.5	< 0.5	3.2	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	2.4	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	2.9	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	1.0	< 0.5
Fluoranthene	0.5	mg/kg	1.0	< 0.5	6.1	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	2.7	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	2.1	< 0.5
Pyrene	0.5	mg/kg	0.9	< 0.5	5.3	< 0.5
Total PAH*	0.5	mg/kg	3.3	< 0.5	33.9	< 0.5
2-Fluorobiphenyl (surr.)	1	%	127	114	103	97
p-Terphenyl-d14 (surr.)	1	%	119	107	92	101
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4,4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4,4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4,4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchloroendate (surr.)	1	%	93	62	129	116
Tetrachloro-m-xylene (surr.)	1	%	80	84	137	137
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			DUP6	DUP7	TRIP5	TRIP6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Ma07812	S18-Ma07813	S18-Ma07814	S18-Ma07815
Date Sampled			Mar 06, 2018	Mar 06, 2018	Mar 06, 2018	Mar 06, 2018
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	93	62	129	116
Tetrachloro-m-xylene (surr.)	1	%	80	84	137	137
Heavy Metals						
Arsenic	2	mg/kg	5.2	14	4.7	8.9
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	13	17	12	14
Copper	5	mg/kg	26	13	12	14
Lead	5	mg/kg	120	17	58	21
Mercury	0.1	mg/kg	0.3	< 0.1	0.2	< 0.1
Nickel	5	mg/kg	< 5	6.2	5.1	7.3
Zinc	5	mg/kg	200	38	99	36
% Moisture	1	%	26	13	19	14

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 (regarding both quality and NATA accreditation).

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 mgt Suite B4			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C36	Melbourne	Mar 12, 2018	14 Day
BTEX - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Mar 12, 2018	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Mar 12, 2018	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Mar 12, 2018	14 Day
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soils by GCMS	Melbourne	Mar 12, 2018	14 Day
Eurofins mgt Suite B13			
Organochlorine Pesticides - Method: LTM-ORG-2220 OCP & PCB in Soil and Water	Melbourne	Mar 12, 2018	14 Day
Polychlorinated Biphenyls - Method: LTM-ORG-2220 OCP & PCB in Soil and Water	Melbourne	Mar 12, 2018	28 Days
Metals M8 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Mar 12, 2018	28 Days
% Moisture - Method: LTM-GEN-7080 Moisture	Melbourne	Mar 07, 2018	14 Day

Company Name: Coffey Geotechnics Pty Ltd Chatswood
Address: Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Project Name: MANN ST GOSFORD
Project ID: SYDGE214942

Order No.:
Report #: 588255
Phone: +61 2 9406 1000
Fax: +61 2 9406 1002

Received: Mar 7, 2018 3:51 PM
Due: Mar 14, 2018
Priority: 5 Day
Contact Name: SIMON HAY

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Metals M8	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
External Laboratory										
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID					
1	BH8 0.0-1.0M	Mar 06, 2018		Soil	S18-Ma07808		X	X	X	X
2	BH8 1.6-2.0M	Mar 06, 2018		Soil	S18-Ma07809		X		X	X
3	BH9 0.0-1.1M	Mar 06, 2018		Soil	S18-Ma07810		X	X	X	X
4	BH9 1.1-1.8M	Mar 06, 2018		Soil	S18-Ma07811		X		X	X
5	DUP6	Mar 06, 2018		Soil	S18-Ma07812		X	X	X	X
6	DUP7	Mar 06, 2018		Soil	S18-Ma07813		X	X	X	X
7	TRIP5	Mar 06, 2018		Soil	S18-Ma07814		X	X	X	X
8	TRIP6	Mar 06, 2018		Soil	S18-Ma07815		X	X	X	X
9	BH8 1.0-1.5M	Mar 06, 2018		Soil	S18-Ma07816	X				

Company Name: Coffey Geotechnics Pty Ltd Chatswood
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Sample Detail						HOLD	Metals M8	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
10	BH8 2.8-3.0M	Mar 06, 2018		Soil	S18-Ma07817	X				
11	BH9 1.8-2.1M	Mar 06, 2018		Soil	S18-Ma07818	X				
12	BH9 2.6-3.0M	Mar 06, 2018		Soil	S18-Ma07819	X				
Test Counts						4	8	6	8	8

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota 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. 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	Quality Systems Manual ver 5.1 US Department of Defense
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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. 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	
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							
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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	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	%	117			70-130	Pass	
TRH C10-C14	%	82			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	97			70-130	Pass	
Toluene	%	95			70-130	Pass	
Ethylbenzene	%	101			70-130	Pass	
m&p-Xylenes	%	98			70-130	Pass	
Xylenes - Total	%	99			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	91			70-130	Pass	
TRH C6-C10	%	114			70-130	Pass	
TRH >C10-C16	%	81			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	87			70-130	Pass	
Acenaphthylene	%	96			70-130	Pass	
Anthracene	%	87			70-130	Pass	
Benz(a)anthracene	%	90			70-130	Pass	
Benzo(a)pyrene	%	87			70-130	Pass	
Benzo(b&j)fluoranthene	%	77			70-130	Pass	

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(g,h,i)perylene				%	107			70-130	Pass	
Benzo(k)fluoranthene				%	79			70-130	Pass	
Chrysene				%	91			70-130	Pass	
Dibenz(a,h)anthracene				%	111			70-130	Pass	
Fluoranthene				%	82			70-130	Pass	
Fluorene				%	90			70-130	Pass	
Indeno(1,2,3-cd)pyrene				%	104			70-130	Pass	
Naphthalene				%	90			70-130	Pass	
Phenanthrene				%	92			70-130	Pass	
Pyrene				%	82			70-130	Pass	
LCS - % Recovery										
Organochlorine Pesticides										
4,4'-DDD				%	115			70-130	Pass	
4,4'-DDE				%	105			70-130	Pass	
4,4'-DDT				%	80			70-130	Pass	
a-BHC				%	94			70-130	Pass	
Aldrin				%	102			70-130	Pass	
b-BHC				%	90			70-130	Pass	
d-BHC				%	96			70-130	Pass	
Dieldrin				%	100			70-130	Pass	
Endosulfan I				%	100			70-130	Pass	
Endosulfan II				%	103			70-130	Pass	
Endosulfan sulphate				%	109			70-130	Pass	
Endrin				%	102			70-130	Pass	
Endrin aldehyde				%	95			70-130	Pass	
Endrin ketone				%	110			70-130	Pass	
g-BHC (Lindane)				%	94			70-130	Pass	
Heptachlor				%	94			70-130	Pass	
Heptachlor epoxide				%	98			70-130	Pass	
Hexachlorobenzene				%	91			70-130	Pass	
Methoxychlor				%	84			70-130	Pass	
LCS - % Recovery										
Polychlorinated Biphenyls										
Aroclor-1260				%	80			70-130	Pass	
LCS - % Recovery										
Heavy Metals										
Arsenic				%	109			80-120	Pass	
Cadmium				%	111			80-120	Pass	
Chromium				%	109			80-120	Pass	
Copper				%	102			80-120	Pass	
Lead				%	112			80-120	Pass	
Mercury				%	118			75-125	Pass	
Nickel				%	102			80-120	Pass	
Zinc				%	114			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	M18-Ma09773	NCP	%	90				70-130	Pass	
Spike - % Recovery										
BTEX				Result 1						
Benzene	M18-Ma09773	NCP	%	80				70-130	Pass	
Toluene	M18-Ma09773	NCP	%	74				70-130	Pass	
Ethylbenzene	M18-Ma09773	NCP	%	85				70-130	Pass	
m&p-Xylenes	M18-Ma09773	NCP	%	81				70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
o-Xylene	M18-Ma09773	NCP	%	83			70-130	Pass	
Xylenes - Total	M18-Ma09773	NCP	%	81			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M18-Ma09773	NCP	%	83			70-130	Pass	
TRH C6-C10	M18-Ma09773	NCP	%	87			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4,4'-DDD	S18-Ma07808	CP	%	123			70-130	Pass	
4,4'-DDE	S18-Ma07808	CP	%	103			70-130	Pass	
4,4'-DDT	S18-Ma07808	CP	%	111			70-130	Pass	
a-BHC	S18-Ma07808	CP	%	95			70-130	Pass	
Aldrin	S18-Ma07808	CP	%	106			70-130	Pass	
b-BHC	S18-Ma07808	CP	%	91			70-130	Pass	
d-BHC	S18-Ma07808	CP	%	98			70-130	Pass	
Dieldrin	S18-Ma07808	CP	%	119			70-130	Pass	
Endosulfan I	S18-Ma07808	CP	%	84			70-130	Pass	
Endosulfan II	S18-Ma07808	CP	%	99			70-130	Pass	
Endosulfan sulphate	S18-Ma07808	CP	%	111			70-130	Pass	
Endrin	S18-Ma07808	CP	%	113			70-130	Pass	
Endrin aldehyde	S18-Ma07808	CP	%	90			70-130	Pass	
Endrin ketone	S18-Ma07808	CP	%	104			70-130	Pass	
g-BHC (Lindane)	S18-Ma07808	CP	%	94			70-130	Pass	
Heptachlor	S18-Ma07808	CP	%	104			70-130	Pass	
Heptachlor epoxide	S18-Ma07808	CP	%	97			70-130	Pass	
Hexachlorobenzene	S18-Ma07808	CP	%	94			70-130	Pass	
Methoxychlor	B18-Ma10742	NCP	%	90			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S18-Ma07812	CP	%	75			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S18-Ma07812	CP	%	75			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S18-Ma07812	CP	%	102			70-130	Pass	
Acenaphthylene	S18-Ma07812	CP	%	110			70-130	Pass	
Anthracene	S18-Ma07812	CP	%	108			70-130	Pass	
Benz(a)anthracene	S18-Ma07812	CP	%	105			70-130	Pass	
Benzo(a)pyrene	S18-Ma07812	CP	%	95			70-130	Pass	
Benzo(b&j)fluoranthene	S18-Ma07812	CP	%	84			70-130	Pass	
Benzo(g,h,i)perylene	S18-Ma07812	CP	%	114			70-130	Pass	
Benzo(k)fluoranthene	S18-Ma07812	CP	%	93			70-130	Pass	
Chrysene	S18-Ma07812	CP	%	101			70-130	Pass	
Dibenz(a,h)anthracene	S18-Ma07812	CP	%	121			70-130	Pass	
Fluoranthene	S18-Ma07812	CP	%	87			70-130	Pass	
Fluorene	S18-Ma07812	CP	%	106			70-130	Pass	
Indeno(1,2,3-cd)pyrene	S18-Ma07812	CP	%	130			70-130	Pass	
Naphthalene	S18-Ma07812	CP	%	103			70-130	Pass	
Phenanthrene	S18-Ma07812	CP	%	109			70-130	Pass	
Pyrene	S18-Ma07812	CP	%	88			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S18-Ma07812	CP	%	104			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Cadmium	S18-Ma07812	CP	%	107			75-125	Pass	
Chromium	S18-Ma07812	CP	%	101			75-125	Pass	
Copper	S18-Ma07812	CP	%	93			75-125	Pass	
Lead	S18-Ma07812	CP	%	88			75-125	Pass	
Mercury	S18-Ma07812	CP	%	110			70-130	Pass	
Nickel	S18-Ma07812	CP	%	98			75-125	Pass	
Zinc	S18-Ma07812	CP	%	83			75-125	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	M18-Ma12529	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M18-Ma12529	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M18-Ma12529	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M18-Ma12529	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M18-Ma12529	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M18-Ma12529	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	M18-Ma12529	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M18-Ma12529	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M18-Ma12529	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M18-Ma12529	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4,4'-DDD	M18-Ma12529	NCP	mg/kg	0.10	0.10	4.0	30%	Pass	
4,4'-DDE	M18-Ma12529	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4,4'-DDT	M18-Ma12529	NCP	mg/kg	0.34	0.29	19	30%	Pass	
a-BHC	M18-Ma12529	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	M18-Ma12529	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	M18-Ma12529	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	M18-Ma12529	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	M18-Ma12529	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	M18-Ma12529	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	M18-Ma12529	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	M18-Ma12529	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	M18-Ma12529	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	M18-Ma12529	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	M18-Ma12529	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	M18-Ma12529	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	M18-Ma12529	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	M18-Ma12529	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	M18-Ma12529	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	M18-Ma12529	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	M18-Ma12529	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	M18-Ma12529	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	M18-Ma12529	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	M18-Ma12529	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	M18-Ma12529	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	M18-Ma12529	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	M18-Ma12529	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	M18-Ma12529	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	

Duplicate								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD		
TRH C10-C14	S18-Ma07811	CP	mg/kg	< 20	< 20	<1	30%	Pass
TRH C15-C28	S18-Ma07811	CP	mg/kg	< 50	< 50	<1	30%	Pass
TRH C29-C36	S18-Ma07811	CP	mg/kg	< 50	< 50	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
TRH >C10-C16	S18-Ma07811	CP	mg/kg	< 50	< 50	<1	30%	Pass
TRH >C16-C34	S18-Ma07811	CP	mg/kg	< 100	< 100	<1	30%	Pass
TRH >C34-C40	S18-Ma07811	CP	mg/kg	< 100	< 100	<1	30%	Pass
Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Acenaphthene	S18-Ma07811	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Acenaphthylene	S18-Ma07811	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Anthracene	S18-Ma07811	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benz(a)anthracene	S18-Ma07811	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(a)pyrene	S18-Ma07811	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(b&j)fluoranthene	S18-Ma07811	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(g,h,i)perylene	S18-Ma07811	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(k)fluoranthene	S18-Ma07811	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chrysene	S18-Ma07811	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dibenz(a,h)anthracene	S18-Ma07811	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluoranthene	S18-Ma07811	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluorene	S18-Ma07811	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	S18-Ma07811	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Naphthalene	S18-Ma07811	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Phenanthrene	S18-Ma07811	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Pyrene	S18-Ma07811	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	S18-Ma07811	CP	mg/kg	< 2	< 2	<1	30%	Pass
Cadmium	S18-Ma07811	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	S18-Ma07811	CP	mg/kg	< 5	< 5	<1	30%	Pass
Copper	S18-Ma07811	CP	mg/kg	< 5	< 5	<1	30%	Pass
Lead	S18-Ma07811	CP	mg/kg	< 5	< 5	<1	30%	Pass
Mercury	S18-Ma07811	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Nickel	S18-Ma07811	CP	mg/kg	< 5	< 5	<1	30%	Pass
Zinc	S18-Ma07811	CP	mg/kg	15	15	1.0	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	S18-Ma07811	CP	%	9.4	10	8.0	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	S18-Ma07812	CP	mg/kg	5.2	5.3	3.0	30%	Pass
Cadmium	S18-Ma07812	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	S18-Ma07812	CP	mg/kg	13	14	4.0	30%	Pass
Copper	S18-Ma07812	CP	mg/kg	26	26	2.0	30%	Pass
Lead	S18-Ma07812	CP	mg/kg	120	120	3.0	30%	Pass
Mercury	S18-Ma07812	CP	mg/kg	0.3	0.4	9.0	30%	Pass
Nickel	S18-Ma07812	CP	mg/kg	< 5	< 5	<1	30%	Pass
Zinc	S18-Ma07812	CP	mg/kg	200	200	2.0	30%	Pass

Comments

Sample Integrity

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

Comments

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

Authorised By

Nibha Vaidya	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 1 of 1 0312

Consigning Office: C. HartmannReport Results to: C. Hartmann

Invoices to:

Mobile:

Email:

Simon Heng

@coffey.com

Phone:

Email:

@coffey.com

Project No: 5406-2140142Task No: EMWProject Name: GravelLaboratory: EMWSampler's Name: CSProject Manager: Simon Heng

Special Instructions:

Relevant agreements: Eurofins COF_ENAUABTF00952AA_MSA1 ; ALS COF_ENAUABTF00952AA_MSA2 and SGS COF_ENAUABTF00952AA_MSA3

Analysis Request Section

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	NOTES
	MW1	12/3	PM	water	1A/12V	ST	Simon Heng will assign samples
	MW2						
	MW3						
	DUP						
	TRIP						
	Rinsers						Solvent to ALS. (after Simon assign samples)
	HA3-00-01			Soil	1A/15		
	HA1-00-01						
	HA2-01-02						
	HA3-05-06						
	DUP				15		Do not test TRIP, only after assign samples
	TRIP 2						
	TRIP block			water	2A/1		
	TRIP spike						

RELINQUISHED BY

Name: _____ Date: _____

Coffey Environments Time: _____

Name: _____ Date: _____

Company: _____ Time: _____

RECEIVED BY

Name: ORON Date: 21/3Company: EURO Mgt Time: 10.4C 12.47am

Name: _____ Date: _____

Company: _____ Time: _____

Sample Receipt Advice: (Lab Use Only)

All Samples Received in Good Condition ☒All Documentation is in Proper Order ☒Samples Received Properly Chilled ☒

Lab. Ref/Batch No.

590364

*Container Type & Preservation Codes: P - Plastic, G - Glass Bottle, J - Glass Jar, V - Vial, Z - Ziplock Bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative, OP - Other Preservative

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 1 of 1

0312

Consigning Office: *Chertsey*Report Results to: *Simon Hay*

Mobile:

Email:

@coffey.com

Invoices to:

Phone:

Email:

@coffey.com

Project No: *SYDGE 2140142*Task No: *EMV10*Project Name: *Gravel*Laboratory: *Europe*Sampler's Name: *CS*Project Manager: *Simon Hay*

Special Instructions:

Relevant agreements: Eurofins COF_ENAUABTF00952AA_MSA1 ; ALS COF_ENAUABTF00952AA_MSA2 and SGS COF_ENAUABTF00952AA_MSA3

Analysis Request Section

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	NOTES
	MW1	19/3	PM	Water	1A/1M2V	STD	Simon Hay will assign samples
	MW2						
	MW3						
	DUP						
	TRIP						
	Rinsate						
	HA3-00-01			Soil	16/15		Salvaged to ALS. (ask Simon) Assign samples
	HA1-00-01						
	HA2-01-02						
	HA2-05-06						
	DUP2						
	TRIP 2						
	TRIP blank			Water	2Vials		to be analysed by ALS
	TRIP spike						Do not test TRIP only RECV and GC-C

RELINQUISHED BY

Name: _____ Date: _____

Coffey Environments Time: _____

Name: _____ Date: _____

Company: _____ Time: _____

RECEIVED BY

Name: *WONG* Date: *8/13 8:12pm*Company: *EURO* Time: _____

Name: _____ Date: _____

Company: _____ Time: _____

Sample Receipt Advice: (Lab Use Only)

All Samples Received in Good Condition ☐All Documentation is in Proper Order ☐Samples Received Properly Chilled ☐

Lab. Ref/Batch No.

590364

*Container Type & Preservation Codes: P - Plastic, G - Glass Bottle, J - Glass Jar, V - Vial, Z - Ziplock Bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative, OP - Other Preservative

Enviro Sample NSW

From: Hay, Simon <Simon.Hay@coffey.com>
Sent: Thursday, 22 March 2018 1:53 PM
To: Enviro Sample NSW
Cc: Asim Khan; Nibha Vaidya
Subject: RE: Eurofins | mgt Sample Receipt Advice - Report 590364 : Site GOSFORD (SYDGE2140142)
Attachments: 590364_COC.PDF; 590364_sample_receipt_coc.pdf; 590364_summary.pdf
Follow Up Flag: Follow up
Flag Status: Flagged

If possible, can I have the groundwater reportedly separately from the soil results, and the rinsate and spike results can be reported with the soil results.

Kind regards

Simon

From: EnviroSampleNSW@eurofins.com [<mailto:EnviroSampleNSW@eurofins.com>]
Sent: Thursday, March 22, 2018 1:08 PM
To: Hay, Simon <Simon.Hay@coffey.com>
Subject: Eurofins | mgt Sample Receipt Advice - Report 590364 : Site GOSFORD (SYDGE2140142)

Dear Valued Client,

Please find attached an updated 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 | mgt Analytical Services Manager as soon as possible to make certain that they get changed.

Regards

Ursula Long
Sample Receipt

Eurofins | mgt
Unit F3, Parkview Building
16 Mars Road
LANE COVE WEST NSW 2066
AUSTRALIA
Phone: +61 299 008 400
Email: EnviroSampleNSW@eurofins.com
Website: environment.eurofins.com.au
[EnviroNote 1076 - PFAS Biota](#)
[EnviroNote 1074 - Passive Samplers for VOCs in Air](#)

Click [here](#) to report this email as spam.

ScannedByWebsenseForEurofins

Sample Receipt Advice

Company name: **Coffey Geotechnics Pty Ltd Chatswood**

Contact name: Simon Hay
Project name: GOSFORD
Project ID: SYDGE2140142
COC number: 0312
Turn around time: 5 Day
Date/Time received: Mar 21, 2018 12:47 PM
Eurofins | mgt reference: **590364**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt
Sample Receipt : 10.4 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Sample containers for volatile analysis received with zero headspace.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.

Notes N/A Custody Seals intact (if used).

TRIP & TRIP2 sent to ALS for analysis

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Simon Hay - simon.hay@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Geotechnics Pty Ltd Chatswood email address.

Certificate of Analysis

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Simon Hay

Report 590364-S
Project name GOSFORD
Project ID SYDGE2140142
Received Date Mar 21, 2018

Client Sample ID			HA1-0.0-0.1	HA2-0.5-0.6	DUP2
Sample Matrix			Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Ma24502	S18-Ma24504	S18-Ma24505
Date Sampled			Mar 19, 2018	Mar 19, 2018	Mar 19, 2018
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 C10-36 (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	%	104	-	99
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	-	< 0.5
TRH C6-C10	20	mg/kg	< 20	-	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	-	< 20
TRH >C10-C16	50	mg/kg	< 50	-	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	-	< 50
TRH >C16-C34	100	mg/kg	< 100	-	< 100
TRH >C34-C40	100	mg/kg	< 100	-	< 100
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

Client Sample ID Sample Matrix Eurofins mgt Sample No. Date Sampled Test/Reference	LOR	Unit	HA1-0.0-0.1 Soil S18-Ma24502 Mar 19, 2018	HA2-0.5-0.6 Soil S18-Ma24504 Mar 19, 2018	DUP2 Soil S18-Ma24505 Mar 19, 2018
Polycyclic Aromatic Hydrocarbons					
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	-	80
p-Terphenyl-d14 (surr.)	1	%	86	-	78
Organochlorine Pesticides					
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1
4,4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05
4,4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05
4,4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05
α-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05
β-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05
δ-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05
γ-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	123	132	120
Tetrachloro-m-xylene (surr.)	1	%	96	104	94
Polychlorinated Biphenyls					
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	123	132	120
Tetrachloro-m-xylene (surr.)	1	%	96	104	94

Client Sample ID			HA1-0.0-0.1	HA2-0.5-0.6	DUP2
Sample Matrix			Soil	Soil	Soil
Eurofins mgt Sample No.			S18-Ma24502	S18-Ma24504	S18-Ma24505
Date Sampled			Mar 19, 2018	Mar 19, 2018	Mar 19, 2018
Test/Reference	LOR	Unit			
Heavy Metals					
Arsenic	2	mg/kg	< 2	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	19	10	34
Copper	5	mg/kg	30	7.8	50
Lead	5	mg/kg	< 5	8.7	9.3
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	45	22	67
Zinc	5	mg/kg	32	15	45
% Moisture	1	%	16	18	8.3

Sample History

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

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
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C36	Melbourne	Mar 23, 2018	14 Day
BTEX - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Mar 23, 2018	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Mar 23, 2018	14 Day
Eurofins mgt Suite B4			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Mar 23, 2018	14 Day
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soils by GCMS	Melbourne	Mar 23, 2018	14 Day
Eurofins mgt Suite B13			
Organochlorine Pesticides - Method: LTM-ORG-2220 OCP & PCB in Soil and Water	Melbourne	Mar 23, 2018	14 Day
Polychlorinated Biphenyls - Method: LTM-ORG-2220 OCP & PCB in Soil and Water	Melbourne	Mar 23, 2018	28 Days
Metals M8 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Mar 23, 2018	28 Days
% Moisture - Method: LTM-GEN-7080 Moisture	Melbourne	Mar 22, 2018	14 Day

Company Name: Coffey Geotechnics Pty Ltd Chatswood
Address: Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: GOSFORD
Project ID: SYDGE2140142

Order No.:
Report #: 590364
Phone: +61 2 9406 1000
Fax: +61 2 9406 1002

Received: Mar 21, 2018 12:47 PM
Due: Mar 28, 2018
Priority: 5 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Metals M8	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
External Laboratory											
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID						
1	RINSATE	Mar 19, 2018		Water	S18-Ma24500	X					
2	HA3-0.0-0.1	Mar 19, 2018		Soil	S18-Ma24501	X					
3	HA1-0.0-0.1	Mar 19, 2018		Soil	S18-Ma24502		X	X	X	X	
4	HA2-0.1-0.2	Mar 19, 2018		Soil	S18-Ma24503	X					
5	HA2-0.5-0.6	Mar 19, 2018		Soil	S18-Ma24504		X	X	X		
6	DUP2	Mar 19, 2018		Soil	S18-Ma24505		X	X	X	X	
7	TRIP BLANK	Mar 19, 2018		Water	S18-Ma24507						X
8	TRIP SPIKE	Mar 19, 2018		Water	S18-Ma24508						X
Test Counts						3	3	3	3	2	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil 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. 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	Quality Systems Manual ver 5.1 US Department of Defense
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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. 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	
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							
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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	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	%	101			70-130	Pass	
TRH C10-C14	%	74			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	81			70-130	Pass	
Toluene	%	111			70-130	Pass	
Ethylbenzene	%	94			70-130	Pass	
m&p-Xylenes	%	99			70-130	Pass	
Xylenes - Total	%	106			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	127			70-130	Pass	
TRH C6-C10	%	98			70-130	Pass	
TRH >C10-C16	%	77			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	90			70-130	Pass	
Acenaphthylene	%	87			70-130	Pass	
Anthracene	%	90			70-130	Pass	
Benz(a)anthracene	%	80			70-130	Pass	
Benzo(a)pyrene	%	94			70-130	Pass	
Benzo(b&j)fluoranthene	%	92			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(g,h,i)perylene			%	78			70-130	Pass	
Benzo(k)fluoranthene			%	113			70-130	Pass	
Chrysene			%	95			70-130	Pass	
Dibenz(a,h)anthracene			%	76			70-130	Pass	
Fluoranthene			%	92			70-130	Pass	
Fluorene			%	89			70-130	Pass	
Indeno(1,2,3-cd)pyrene			%	79			70-130	Pass	
Naphthalene			%	88			70-130	Pass	
Phenanthrene			%	87			70-130	Pass	
Pyrene			%	84			70-130	Pass	
LCS - % Recovery									
Organochlorine Pesticides									
4,4'-DDD			%	96			70-130	Pass	
4,4'-DDE			%	100			70-130	Pass	
4,4'-DDT			%	99			70-130	Pass	
a-BHC			%	84			70-130	Pass	
Aldrin			%	96			70-130	Pass	
b-BHC			%	80			70-130	Pass	
d-BHC			%	85			70-130	Pass	
Dieldrin			%	106			70-130	Pass	
Endosulfan I			%	105			70-130	Pass	
Endosulfan II			%	105			70-130	Pass	
Endosulfan sulphate			%	103			70-130	Pass	
Endrin			%	104			70-130	Pass	
Endrin aldehyde			%	95			70-130	Pass	
Endrin ketone			%	105			70-130	Pass	
g-BHC (Lindane)			%	86			70-130	Pass	
Heptachlor			%	93			70-130	Pass	
Heptachlor epoxide			%	99			70-130	Pass	
Hexachlorobenzene			%	79			70-130	Pass	
Methoxychlor			%	99			70-130	Pass	
LCS - % Recovery									
Polychlorinated Biphenyls									
Aroclor-1260			%	98			70-130	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic			%	112			80-120	Pass	
Cadmium			%	112			80-120	Pass	
Chromium			%	118			80-120	Pass	
Copper			%	115			80-120	Pass	
Lead			%	118			80-120	Pass	
Mercury			%	111			75-125	Pass	
Nickel			%	114			80-120	Pass	
Zinc			%	109			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	M18-Ma18276	NCP	%	75			70-130	Pass	
TRH C10-C14	M18-Ma25504	NCP	%	82			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M18-Ma18276	NCP	%	76			70-130	Pass	
Toluene	M18-Ma18276	NCP	%	88			70-130	Pass	
Ethylbenzene	M18-Ma18276	NCP	%	83			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
m&p-Xylenes	M18-Ma18276	NCP	%	84			70-130	Pass	
o-Xylene	M18-Ma18276	NCP	%	101			70-130	Pass	
Xylenes - Total	M18-Ma18276	NCP	%	90			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M18-Ma18276	NCP	%	123			70-130	Pass	
TRH C6-C10	M18-Ma18276	NCP	%	73			70-130	Pass	
TRH >C10-C16	M18-Ma25504	NCP	%	72			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M18-Ma23235	NCP	%	93			70-130	Pass	
Acenaphthylene	M18-Ma23235	NCP	%	91			70-130	Pass	
Anthracene	M18-Ma23235	NCP	%	99			70-130	Pass	
Benz(a)anthracene	M18-Ma23235	NCP	%	89			70-130	Pass	
Benzo(a)pyrene	M18-Ma23235	NCP	%	94			70-130	Pass	
Benzo(b&j)fluoranthene	M18-Ma23235	NCP	%	87			70-130	Pass	
Benzo(g,h,i)perylene	M18-Ma23235	NCP	%	82			70-130	Pass	
Benzo(k)fluoranthene	M18-Ma23235	NCP	%	105			70-130	Pass	
Chrysene	M18-Ma23235	NCP	%	97			70-130	Pass	
Dibenz(a,h)anthracene	M18-Ma23235	NCP	%	77			70-130	Pass	
Fluoranthene	M18-Ma23235	NCP	%	101			70-130	Pass	
Fluorene	M18-Ma23235	NCP	%	93			70-130	Pass	
Indeno(1,2,3-cd)pyrene	M18-Ma23235	NCP	%	82			70-130	Pass	
Naphthalene	M18-Ma23235	NCP	%	92			70-130	Pass	
Phenanthrene	M18-Ma23235	NCP	%	84			70-130	Pass	
Pyrene	M18-Ma23235	NCP	%	96			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4,4'-DDD	M18-Ma17676	NCP	%	125			70-130	Pass	
4,4'-DDE	M18-Ma17676	NCP	%	119			70-130	Pass	
4,4'-DDT	M18-Ma17676	NCP	%	122			70-130	Pass	
a-BHC	M18-Ma17676	NCP	%	92			70-130	Pass	
Aldrin	M18-Ma17676	NCP	%	101			70-130	Pass	
b-BHC	M18-Ma17676	NCP	%	88			70-130	Pass	
d-BHC	M18-Ma17676	NCP	%	99			70-130	Pass	
Dieldrin	M18-Ma17676	NCP	%	120			70-130	Pass	
Endosulfan I	M18-Ma17676	NCP	%	115			70-130	Pass	
Endosulfan II	M18-Ma17676	NCP	%	127			70-130	Pass	
Endosulfan sulphate	M18-Ma17676	NCP	%	110			70-130	Pass	
Endrin	M18-Ma17676	NCP	%	129			70-130	Pass	
Endrin aldehyde	M18-Ma17676	NCP	%	127			70-130	Pass	
Endrin ketone	M18-Ma17676	NCP	%	112			70-130	Pass	
g-BHC (Lindane)	M18-Ma17676	NCP	%	95			70-130	Pass	
Heptachlor	M18-Ma17676	NCP	%	99			70-130	Pass	
Heptachlor epoxide	M18-Ma17676	NCP	%	108			70-130	Pass	
Hexachlorobenzene	M18-Ma17676	NCP	%	87			70-130	Pass	
Methoxychlor	M18-Ma17676	NCP	%	121			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	P18-Ma24704	NCP	%	102			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	P18-Ma24702	NCP	%	88			75-125	Pass	
Cadmium	P18-Ma24702	NCP	%	100			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Chromium	M18-Ma25517	NCP	%	116			75-125	Pass	
Copper	P18-Ma24702	NCP	%	108			75-125	Pass	
Lead	P18-Ma24702	NCP	%	94			75-125	Pass	
Mercury	P18-Ma24702	NCP	%	109			70-130	Pass	
Nickel	P18-Ma24702	NCP	%	101			75-125	Pass	
Zinc	P18-Ma24702	NCP	%	109			75-125	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	M18-Ma24164	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M18-Ma27237	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M18-Ma27237	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M18-Ma27237	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M18-Ma24164	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M18-Ma24164	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M18-Ma24164	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M18-Ma24164	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M18-Ma24164	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	M18-Ma24164	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M18-Ma24164	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M18-Ma24164	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	M18-Ma27237	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M18-Ma27237	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M18-Ma27237	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M18-Ma30905	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M18-Ma30905	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M18-Ma30905	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M18-Ma30905	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	M18-Ma30905	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M18-Ma30905	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g,h,i)perylene	M18-Ma30905	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M18-Ma30905	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M18-Ma30905	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a,h)anthracene	M18-Ma30905	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M18-Ma30905	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	M18-Ma30905	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1,2,3-cd)pyrene	M18-Ma30905	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M18-Ma30905	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M18-Ma30905	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M18-Ma30905	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	P18-Ma24704	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4,4'-DDD	P18-Ma24704	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4,4'-DDE	P18-Ma24704	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4,4'-DDT	P18-Ma24704	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	P18-Ma24704	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	P18-Ma24704	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate								
Organochlorine Pesticides				Result 1	Result 2	RPD		
b-BHC	P18-Ma24704	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
d-BHC	P18-Ma24704	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Dieldrin	P18-Ma24704	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan I	P18-Ma24704	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan II	P18-Ma24704	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan sulphate	P18-Ma24704	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin	P18-Ma24704	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin aldehyde	P18-Ma24704	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin ketone	P18-Ma24704	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
g-BHC (Lindane)	P18-Ma24704	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor	P18-Ma24704	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor epoxide	P18-Ma24704	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Hexachlorobenzene	P18-Ma24704	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Methoxychlor	P18-Ma24704	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Toxaphene	P18-Ma24704	NCP	mg/kg	< 1	< 1	<1	30%	Pass
Duplicate								
Polychlorinated Biphenyls				Result 1	Result 2	RPD		
Aroclor-1016	P18-Ma24704	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1221	P18-Ma24704	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1232	P18-Ma24704	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1242	P18-Ma24704	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1248	P18-Ma24704	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1254	P18-Ma24704	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1260	P18-Ma24704	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Total PCB*	P18-Ma24704	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M18-Ma27326	NCP	mg/kg	5.4	5.7	5.0	30%	Pass
Cadmium	M18-Ma27326	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	M18-Ma27326	NCP	mg/kg	12	12	2.0	30%	Pass
Copper	M18-Ma27326	NCP	mg/kg	9.8	9.9	1.0	30%	Pass
Lead	M18-Ma27326	NCP	mg/kg	5.0	5.1	2.0	30%	Pass
Mercury	M18-Ma27326	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Nickel	M18-Ma27326	NCP	mg/kg	9.0	9.2	2.0	30%	Pass
Zinc	M18-Ma27326	NCP	mg/kg	22	22	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	P18-Ma24459	NCP	%	3.0	3.3	9.0	30%	Pass

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
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

Authorised By

Nibha Vaidya	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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Certificate of Analysis

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Simon Hay

Report 590364-W
Project name GOSFORD
Project ID SYDGE2140142
Received Date Mar 21, 2018

Client Sample ID			TRIP BLANK	R20 TRIP SPIKE
Sample Matrix			Water	Water
Eurofins mgt Sample No.			S18-Ma24507	S18-Ma24508
Date Sampled			Mar 19, 2018	Mar 19, 2018
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene ^{N02}	0.01	mg/L	< 0.01	110
TRH C6-C10	0.02	mg/L	< 0.02	86
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	-
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	0.02	mg/L	< 0.02	89
BTEX				
Benzene	0.001	mg/L	< 0.001	80
Toluene	0.001	mg/L	< 0.001	78
Ethylbenzene	0.001	mg/L	< 0.001	78
m&p-Xylenes	0.002	mg/L	< 0.002	78
o-Xylene	0.001	mg/L	< 0.001	84
Xylenes - Total	0.003	mg/L	< 0.003	80
4-Bromofluorobenzene (surr.)	1	%	89	81

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 (regarding both quality and NATA accreditation).

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
Total Recoverable Hydrocarbons	Melbourne	Mar 22, 2018	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Mar 22, 2018	7 Day
- Method: LTM-ORG-2010 TRH C6-C36			
BTEX	Melbourne	Mar 22, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			

Company Name: Coffey Geotechnics Pty Ltd Chatswood
Address: Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: GOSFORD
Project ID: SYDGE2140142

Order No.:
Report #: 590364
Phone: +61 2 9406 1000
Fax: +61 2 9406 1002

Received: Mar 21, 2018 12:47 PM
Due: Mar 28, 2018
Priority: 5 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Metals M8	Eurofins mgt Suite B13	Moisture Set	Eurofins mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
External Laboratory											
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID						
1	RINSATE	Mar 19, 2018		Water	S18-Ma24500	X					
2	HA3-0.0-0.1	Mar 19, 2018		Soil	S18-Ma24501	X					
3	HA1-0.0-0.1	Mar 19, 2018		Soil	S18-Ma24502		X	X	X	X	
4	HA2-0.1-0.2	Mar 19, 2018		Soil	S18-Ma24503	X					
5	HA2-0.5-0.6	Mar 19, 2018		Soil	S18-Ma24504		X	X	X		
6	DUP2	Mar 19, 2018		Soil	S18-Ma24505		X	X	X	X	
7	TRIP BLANK	Mar 19, 2018		Water	S18-Ma24507						X
8	TRIP SPIKE	Mar 19, 2018		Water	S18-Ma24508						X
Test Counts						3	3	3	3	2	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil 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. 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	Quality Systems Manual ver 5.1 US Department of Defense
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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. 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 - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	129			70-130	Pass	
TRH C6-C10	%	111			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	112			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	94			70-130	Pass	
Toluene	%	93			70-130	Pass	
Ethylbenzene	%	95			70-130	Pass	
m&p-Xylenes	%	100			70-130	Pass	
Xylenes - Total	%	99			70-130	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
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.
R20	This sample is a Trip Spike and therefore all results are reported as a percentage

Authorised By

Nibha Vaidya	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 1 of 1

0312

4

Consigning Office: ChertknaelReport Results to: Simon Hay

Mobile:

Email: Simon Hay

@coffey.com

Invoices to:

Phone:

Email:

@coffey.com

Project No: SYDGE2140142 Task No: EM180
 Project Name: Geotek Laboratory: Environ
 Sampler's Name: LS Project Manager: Simon Hay
 Special Instructions:
 Relevant agreements: Eurofins COF_ENAUABTF00952AA_MSA1; ALS COF_ENAUABTF00952AA_MSA2 and SGS COF_ENAUABTF00952AA_MSA3

Analysis Request Section

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	Notes
	MW1	12/3	PM	Water	1A/MZV	STP	Simon Hay will assign analyst
	MW2						
	MW3						
	DUP						
	TRIP						
	Rinsates						
	HA3-00-01			Soil	16/15		Forward to ALS
	HA1-00-01						(ask Simon)
	HA2-01-02						Assign analyst
	HA2-05-06						
	DUP2						
	TRIP 2						
	TRIP blank			Water	2 vials		
	TRIP Spike						

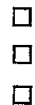
Environmental Division
Melbourne

Work Order Reference

EM1805105



Telephone: 91-3-8548 9800



RELINQUISHED BY

Name: _____ Date: 23/3
 Coffey Environments Time: 6:00
 Name: LS Date: 23/3
 Company: S Time: 6:00

RECEIVED BY

Name: LS Date: 23/3
 Company: An Time: 9:00
 Name: _____ Date: _____
 Company: _____ Time: _____

*Container Type & Preservation Codes: P - Plastic, G- Glass Bottle, J - Glass Jar, V- Vial, Z - Ziplock Bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative, OP - Other Preservative

**SAMPLE RECEIPT NOTIFICATION (SRN)****Work Order : EM1805105****Amendment : 1**

Client : COFFEY ENVIRONMENTS PTY LTD
Contact : MR SIMON HAY
Address : LEVEL 19, 799 PACIFIC HIGHWAY
Tower B - Citadel Tower
CHATSWOOD NSW, AUSTRALIA 2067

Laboratory : Environmental Division Melbourne
Contact : Bronwyn Sheen
Address : 4 Westall Rd Springvale VIC Australia
3171

E-mail : simon.hay@coffey.com**Telephone : ---****Facsimile : ---****E-mail : bronwyn.sheen@alsglobal.com****Telephone : +61-3-8549 9636****Facsimile : +61-3-8549 9626****Project : SYDGE2140142 Enviro Gosford****Order number :****C-O-C number : 0312****Site : ---****Sampler : LS****Page : 1 of 2****Quote number : EM2017COFENV0001 (EN/077/16)****QC Level : NEPM 2013 B3 & ALS QC Standard****Dates****Date Samples Received : 23-Mar-2018 09:00****Client Requested Due : 04-Apr-2018****Date****Issue Date : 03-Apr-2018****Scheduled Reporting Date : 04-Apr-2018****Delivery Details****Mode of Delivery : Carrier****No. of coolers/boxes : 1****Receipt Detail :****Security Seal : Not Available****Temperature : 9.3°C - Ice present****No. of samples received / analysed : 1 / 1****General Comments**

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **Sample(s) received in non-ALS container(s).**
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **Analytical work for this work order will be conducted at ALS Springvale.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

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

- ### Summary of Sample(s) and Requested Analysis

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Laboratory sample ID	Client sampling date / time	Client sample ID

EM1805105-001	19-Mar-2018 00:00	TRIP2	✓	✓	✓

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

CHAT-GeneralAdmin@coffey.com

Email
Email
Email
Email
Email
Email
Email

`simon.hay@coffey.com`



Environmental

CERTIFICATE OF ANALYSIS

Work Order	: EM1805105	Page	: 1 of 7
Amendment	: 1		
Client	: COFFEY ENVIRONMENTS PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: MR SIMON HAY	Contact	: Bronwyn Sheen
Address	: LEVEL 19, 799 PACIFIC HIGHWAY Tower B - Citadel Tower CHATSWOOD NSW, AUSTRALIA 2067	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61-3-8549 9636
Project	: SYDGE2140142 Enviro Gosford	Date Samples Received	: 23-Mar-2018 09:00
Order number	:	Date Analysis Commenced	: 23-Mar-2018
C-O-C number	: 0312	Issue Date	: 03-Apr-2018 17:23
Sampler	: LS		
Site	: ----		
Quote number	: EN/077/16		
No. of samples received	: 1		
No. of samples analysed	: 1		



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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Amendment (03/04/2018): This report has been amended and re-released to allow the reporting of additional analytical data.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenzo(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR.
Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		Client sample ID		TRIP2	----	----	----	----
Client sampling date / time		19-Mar-2018 00:00		----	----	----	----	----
Compound	CAS Number	LOR	Unit	EM1805105-001	-----	-----	-----	-----
Result				----	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	6.7	----	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	20	----	----	----	----
Copper	7440-50-8	5	mg/kg	34	----	----	----	----
Lead	7439-92-1	5	mg/kg	<5	----	----	----	----
Nickel	7440-02-0	2	mg/kg	42	----	----	----	----
Zinc	7440-66-6	5	mg/kg	33	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Aroclor 1016	12674-11-2	0.1	mg/kg	<0.1	----	----	----	----
Aroclor 1221	11104-28-2	0.1	mg/kg	<0.1	----	----	----	----
Aroclor 1232	11141-16-5	0.1	mg/kg	<0.1	----	----	----	----
Aroclor 1242	53469-21-9	0.1	mg/kg	<0.1	----	----	----	----
Aroclor 1248	12672-29-6	0.1	mg/kg	<0.1	----	----	----	----
Aroclor 1254	11097-69-1	0.1	mg/kg	<0.1	----	----	----	----
Aroclor 1260	11096-82-5	0.1	mg/kg	<0.1	----	----	----	----
Aroclor 1262	37324-23-5	0.1	mg/kg	<0.1	----	----	----	----
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	----	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TRIP2	----	----	----	----
Client sampling date / time					19-Mar-2018 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM1805105-001	-----	-----	-----	-----
					Result	----	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued									
Dieldrin	60-57-1	0.05	mg/kg		<0.05	----	----	----	----
4,4'-DDE	72-55-9	0.05	mg/kg		<0.05	----	----	----	----
Endrin	72-20-8	0.05	mg/kg		<0.05	----	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	----	----	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	----	----	----	----
4,4'-DDD	72-54-8	0.05	mg/kg		<0.05	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	----	----	----	----
4,4'-DDT	50-29-3	0.2	mg/kg		<0.2	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	----	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	----	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	----	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	----	----	----	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	----	----	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg		<0.5	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		0.6	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		1.2	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TRIP2	----	----	----	----
Client sampling date / time					19-Mar-2018 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM1805105-001	-----	-----	-----	-----
					Result	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	----	----	----	----
^ Total Xylenes	----	0.5	mg/kg		<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	----	----	----	----
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		81.9	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		89.0	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		91.9	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		96.4	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		100	----	----	----	----
2,4,6-Tribromophenol	118-79-6	0.5	%		71.2	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TRIP2	----	----	----	----
				Client sampling date / time	19-Mar-2018 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM1805105-001	-----	-----	-----	-----
					Result	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		104	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%		119	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		112	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		88.3	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		97.8	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		72.8	----	----	----	----



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	36	140
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	38	128
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	33	139
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	54	125
2-Chlorophenol-D4	93951-73-6	65	123
2,4,6-Tribromophenol	118-79-6	34	122
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	61	125
Anthracene-d10	1719-06-8	62	130
4-Terphenyl-d14	1718-51-0	67	133
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	51	125
Toluene-D8	2037-26-5	55	125
4-Bromofluorobenzene	460-00-4	56	124

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 1 of 1 0312

Consigning Office: ChetwoodReport Results to: Simon HeyInvoices to: Simon Hey

Mobile:

Phone:

@coffey.com

@coffey.com

Project No: SP06-E 214C142 Task No: EM010
Project Name: Geobid Laboratory: Forth
Sampler's Name: CS Project Manager: Simon Hey
Special Instructions:

Relevant agreements: Eurofins COF_ENAUABTF00952AA_MSA1; ALS COF_ENAUABTF00952AA_MSA2 and SGS COF_ENAUABTF00952AA_MSA3

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)
	MW1	12/3	10:40	Water	100% V	ST
	MW2					
	MW3					
	DUP					
	TRIP					
	Rinsers					
	HA3-010-01			Soil	16/15	
	HA1-010-01					
	HA2-010-02					
	HA3-010-03					
	DUP					
	TRIP 2					
	TRIP blank					
	TRIP spike					

NOTES

Simon Hey will
analyse samples

Solvent to AL2
Cister S. 1000
Analyse samples

No not test
TRIP only after
and Rinsers

RELINQUISHED BY

Name: _____ Date: _____

Coffey Environments _____ Time: _____

Name: _____ Date: _____

Company: _____ Time: _____

RECEIVED BY

Name: CHONG Date: 10.4.13Company: EURO Time: 12.47pm

Name: _____ Date: _____

Company: _____ Time: _____

Sample Receipt Advice: (Lab Use Only)

All Samples Received in Good Condition ☒All Documentation is in Proper Order ☒Samples Received Properly Chilled ☒

Lab. Ref/Batch No.

590364

*Container Type & Preservation Codes: P - Plastic, G - Glass Bottle, J - Glass Jar, V - Vial, Z - Ziplock Bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative, OP - Other Preservative

Coffey Environments

Version: 5

Issue Date: 11/08/2014

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 1 of 1 0312



Consigning Office: *Chetford*

Report Results to: *Simon Hay*

Mobile:

Email: *Simon.Hay*

@coffey.com

Invoices to:

Phone:

Email:

@coffey.com

Project No: *5460-2140142* Task No: *FM10*
 Project Name: *Gravel* Laboratory: *Gravel*
 Sampler's Name: *CS* Project Manager: *Simon Hay*

Special Instructions:

Relevant agreements: Eurofins COF_ENAUABTF00952AA_MSA1; ALS COF_ENAUABTF00952AA_MSA2 and SGS COF_ENAUABTF00952AA_MSA3

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)
	<i>MW1</i>	<i>19/3 PM</i>		<i>water</i>	<i>1A1M2V STD</i>	
	<i>MW2</i>					
	<i>MW3</i>					
	<i>DUP</i>					
	<i>TRIP</i>					
	<i>Rinsates</i>					
	<i>HA3-00-01</i>			<i>Soil</i>	<i>16.15</i>	
	<i>HA1-00-01</i>					
	<i>HA2-01-02</i>					
	<i>HA2-01-02-06</i>					
	<i>DUP2</i>					
	<i>TRIP 2</i>					
	<i>TRIP block</i>					
	<i>TRIP Spk</i>					

Analysis Request Section

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	Notes
							<i>Simon Hay will analyse</i>
							<i>Solvent to ALS</i>
							<i>Can be Simon</i>
							<i>Argon analysis</i>
							<i>to be analysed by ALS</i>
							<i>Do not test TRIP only REU</i>

RELINQUISHED BY

Name: *Simon Hay* Date: *8/13 8:12 PM*
 Coffey Environments Company: *TRIP Spk*
 Name: Date: Time:
 Company: Name: Company:

RECEIVED BY

Name: *Simon Hay* Date: *8/13 8:12 PM*
 Coffey Environments Company: *TRIP Spk*
 Name: Date: Time:
 Company: Name: Company:

Sample Receipt Advice: (Lab Use Only)
☐ All Samples Received in Good Condition
☐ All Documentation is in Proper Order
☐ Samples Received Properly Chilled
 Lab. Ref/Batch No. *S910364*

*Container Type & Preservation Codes: P - Plastic, G - Glass Bottle, J - Glass Jar, V - Vial, Z - Ziplock Bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative, OP - Other Preservative

Enviro Sample NSW

From: Hay, Simon <Simon.Hay@coffey.com>
Sent: Thursday, 22 March 2018 1:53 PM
To: Enviro Sample NSW
Cc: Asim Khan; Nibha Vaidya
Subject: RE: Eurofins | mgt Sample Receipt Advice - Report 590364 : Site GOSFORD (SYDGE2140142)
Attachments: 590364_COC.PDF; 590364_sample_receipt_coc.pdf; 590364_summary.pdf
Follow Up Flag: Follow up
Flag Status: Flagged

If possible, can I have the groundwater reportedly separately from the soil results, and the rinsate and spike results can be reported with the soil results.

Kind regards

Simon

From: EnviroSampleNSW@eurofins.com [<mailto:EnviroSampleNSW@eurofins.com>]
Sent: Thursday, March 22, 2018 1:08 PM
To: Hay, Simon <Simon.Hay@coffey.com>
Subject: Eurofins | mgt Sample Receipt Advice - Report 590364 : Site GOSFORD (SYDGE2140142)

Dear Valued Client,

Please find attached an updated 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 | mgt Analytical Services Manager as soon as possible to make certain that they get changed.

Regards

Ursula Long
Sample Receipt

Eurofins | mgt
Unit F3, Parkview Building
16 Mars Road
LANE COVE WEST NSW 2066
AUSTRALIA
Phone: +61 299 008 400
Email: EnviroSampleNSW@eurofins.com
Website: environment.eurofins.com.au
[EnviroNote 1076 - PFAS Biota](#)
[EnviroNote 1074 - Passive Samplers for VOCs in Air](#)

Click [here](#) to report this email as spam.

ScannedByWebsenseForEurofins

Sample Receipt Advice

Company name: **Coffey Geotechnics Pty Ltd Chatswood**

Contact name: Simon Hay
Project name: GOSFORD
Project ID: SYDGE2140142
COC number: Not provided
Turn around time: 5 Day
Date/Time received: Mar 21, 2018 12:47 PM
Eurofins | mgt reference: **590575**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 10.4 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Sample containers for volatile analysis received with zero headspace.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Simon Hay - simon.hay@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Geotechnics Pty Ltd Chatswood email address.

Certificate of Analysis

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Simon Hay

Report 590575-W
Project name GOSFORD
Project ID SYDGE2140142
Received Date Mar 21, 2018

Client Sample ID			MW1 Water	MW2 Water	MW3 Water	DUP Water
Sample Matrix			S18-Ma24496	S18-Ma24497	S18-Ma24498	S18-Ma24499
Eurofins mgt Sample No.			Mar 19, 2018	Mar 19, 2018	Mar 19, 2018	Mar 19, 2018
Date Sampled						
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	83	82	75	77
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Heavy Metals						
Arsenic (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	< 0.001	0.002	< 0.001	< 0.001
Lead (filtered)	0.001	mg/L	< 0.001	0.001	< 0.001	< 0.001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel (filtered)	0.001	mg/L	0.002	0.004	0.002	0.002
Zinc (filtered)	0.005	mg/L	< 0.005	0.011	0.008	< 0.005

Client Sample ID			MW1	MW2	MW3	DUP
Sample Matrix			Water (Trace)	Water (Trace)	Water (Trace)	Water (Trace)
Eurofins mgt Sample No.			S18-Ma24509	S18-Ma24510	S18-Ma24511	S18-Ma24512
Date Sampled			Mar 19, 2018	Mar 19, 2018	Mar 19, 2018	Mar 19, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Acenaphthylene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Anthracene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Benz(a)anthracene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Benzo(a)pyrene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Benzo(b&j)fluoranthene ^{N07}	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Benzo(g,h,i)perylene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Benzo(k)fluoranthene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Chrysene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Dibenz(a,h)anthracene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Fluoranthene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Fluorene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Indeno(1,2,3-cd)pyrene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Naphthalene	0.00001	mg/L	0.00006	0.00017	0.00001	0.00005
Phenanthrene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Pyrene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Total PAH*	0.00001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	99	105	81	97
p-Terphenyl-d14 (surr.)	1	%	132	121	97	115

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 (regarding both quality and NATA accreditation).

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
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C36	Melbourne	Mar 27, 2018	7 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Mar 22, 2018	7 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Mar 27, 2018	7 Day
BTEX and Naphthalene BTEX - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Mar 22, 2018	14 Day
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Melbourne	Mar 27, 2018	7 Day
Metals M8 filtered - Method: LTM-MET-3040 Metals in Waters by ICP-MS	Melbourne	Mar 22, 2018	28 Day

Company Name: Coffey Geotechnics Pty Ltd Chatswood
Address: Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067
Project Name: GOSFORD
Project ID: SYDGE2140142

Order No.:
Report #: 590575
Phone: +61 2 9406 1000
Fax: +61 2 9406 1002

Received: Mar 21, 2018 12:47 PM
Due: Mar 29, 2018
Priority: 5 Day
Contact Name: Simon Hay

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Polycyclic Aromatic Hydrocarbons	Metals M8 filtered	BTEX and Naphthalene	Total Recoverable Hydrocarbons
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									
External Laboratory									
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID				
1	MW1	Mar 19, 2018		Water	S18-Ma24496		X	X	X
2	MW2	Mar 19, 2018		Water	S18-Ma24497		X	X	X
3	MW3	Mar 19, 2018		Water	S18-Ma24498		X	X	X
4	DUP	Mar 19, 2018		Water	S18-Ma24499		X	X	X
5	MW1	Mar 19, 2018		Water (Trace)	S18-Ma24509	X			
6	MW2	Mar 19, 2018		Water (Trace)	S18-Ma24510	X			
7	MW3	Mar 19, 2018		Water (Trace)	S18-Ma24511	X			
8	DUP	Mar 19, 2018		Water (Trace)	S18-Ma24512	X			
Test Counts						4	4	4	4

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil 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. 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	Quality Systems Manual ver 5.1 US Department of Defense
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 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. 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/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.00001			0.00001	Pass	
Acenaphthylene	mg/L	< 0.00001			0.00001	Pass	
Anthracene	mg/L	< 0.00001			0.00001	Pass	
Benz(a)anthracene	mg/L	< 0.00001			0.00001	Pass	
Benzo(a)pyrene	mg/L	< 0.00001			0.00001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.00001			0.00001	Pass	
Benzo(g,h,i)perylene	mg/L	< 0.00001			0.00001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.00001			0.00001	Pass	
Chrysene	mg/L	< 0.00001			0.00001	Pass	
Dibenz(a,h)anthracene	mg/L	< 0.00001			0.00001	Pass	
Fluoranthene	mg/L	< 0.00001			0.00001	Pass	
Fluorene	mg/L	< 0.00001			0.00001	Pass	
Indeno(1,2,3-cd)pyrene	mg/L	< 0.00001			0.00001	Pass	
Naphthalene	mg/L	< 0.00001			0.00001	Pass	
Phenanthrene	mg/L	< 0.00001			0.00001	Pass	
Pyrene	mg/L	< 0.00001			0.00001	Pass	
Method Blank							
Heavy Metals							
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	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	112			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH C10-C14			%	96			70-130	Pass	
LCS - % Recovery									
BTEX									
Benzene		%	94				70-130	Pass	
Toluene		%	93				70-130	Pass	
Ethylbenzene		%	95				70-130	Pass	
m&p-Xylenes		%	100				70-130	Pass	
Xylenes - Total		%	99				70-130	Pass	
LCS - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions									
Naphthalene		%	129				70-130	Pass	
TRH C6-C10		%	111				70-130	Pass	
TRH >C10-C16		%	89				70-130	Pass	
LCS - % Recovery									
Polycyclic Aromatic Hydrocarbons									
Acenaphthene		%	97				70-130	Pass	
Acenaphthylene		%	100				70-130	Pass	
Anthracene		%	101				70-130	Pass	
Benz(a)anthracene		%	115				70-130	Pass	
Benzo(a)pyrene		%	119				70-130	Pass	
Benzo(b&j)fluoranthene		%	113				70-130	Pass	
Benzo(g,h,i)perylene		%	83				70-130	Pass	
Benzo(k)fluoranthene		%	120				70-130	Pass	
Chrysene		%	101				70-130	Pass	
Dibenz(a,h)anthracene		%	103				70-130	Pass	
Fluoranthene		%	100				70-130	Pass	
Fluorene		%	95				70-130	Pass	
Indeno(1.2.3-cd)pyrene		%	103				70-130	Pass	
Naphthalene		%	92				70-130	Pass	
Phenanthrene		%	94				70-130	Pass	
Pyrene		%	100				70-130	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic (filtered)		%	97				80-120	Pass	
Cadmium (filtered)		%	92				80-120	Pass	
Chromium (filtered)		%	92				80-120	Pass	
Copper (filtered)		%	92				80-120	Pass	
Lead (filtered)		%	96				80-120	Pass	
Mercury (filtered)		%	87				70-130	Pass	
Nickel (filtered)		%	93				80-120	Pass	
Zinc (filtered)		%	92				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 C10-C14	M18-Ma18469	NCP	%	104			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M18-Ma18469	NCP	%	95			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	S18-Ma24641	NCP	%	98			70-130	Pass	
Cadmium (filtered)	S18-Ma24641	NCP	%	89			70-130	Pass	
Chromium (filtered)	S18-Ma24641	NCP	%	90			70-130	Pass	
Copper (filtered)	S18-Ma24641	NCP	%	88			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Lead (filtered)	S18-Ma24641	NCP	%	92			70-130	Pass	
Mercury (filtered)	S18-Ma24641	NCP	%	81			70-130	Pass	
Nickel (filtered)	S18-Ma24641	NCP	%	88			70-130	Pass	
Zinc (filtered)	S18-Ma24641	NCP	%	89			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	P18-Ma26597	NCP	%	89			70-130	Pass	
Acenaphthylene	P18-Ma26597	NCP	%	92			70-130	Pass	
Anthracene	P18-Ma26597	NCP	%	111			70-130	Pass	
Benz(a)anthracene	P18-Ma26597	NCP	%	122			70-130	Pass	
Benzo(a)pyrene	P18-Ma26597	NCP	%	121			70-130	Pass	
Benzo(b&j)fluoranthene	P18-Ma26597	NCP	%	129			70-130	Pass	
Benzo(g,h,i)perylene	P18-Ma26597	NCP	%	108			70-130	Pass	
Benzo(k)fluoranthene	P18-Ma26597	NCP	%	123			70-130	Pass	
Chrysene	P18-Ma26597	NCP	%	111			70-130	Pass	
Dibenz(a,h)anthracene	P18-Ma26597	NCP	%	74			70-130	Pass	
Fluoranthene	P18-Ma26597	NCP	%	108			70-130	Pass	
Fluorene	P18-Ma26597	NCP	%	83			70-130	Pass	
Indeno(1,2,3-cd)pyrene	P18-Ma24970	NCP	%	121			70-130	Pass	
Naphthalene	P18-Ma26597	NCP	%	73			70-130	Pass	
Phenanthrene	P18-Ma26597	NCP	%	97			70-130	Pass	
Pyrene	P18-Ma26597	NCP	%	108			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 C10-C14	S18-Ma24496	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	S18-Ma24496	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	S18-Ma24496	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S18-Ma24496	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	S18-Ma24496	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	S18-Ma24496	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	S18-Ma24641	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium (filtered)	S18-Ma24641	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	S18-Ma24641	NCP	mg/L	0.001	0.001	4.0	30%	Pass	
Copper (filtered)	S18-Ma24641	NCP	mg/L	0.003	0.003	2.0	30%	Pass	
Lead (filtered)	S18-Ma24641	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury (filtered)	S18-Ma24641	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	S18-Ma24641	NCP	mg/L	0.006	0.006	<1	30%	Pass	
Zinc (filtered)	S18-Ma24641	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S18-Ma24510	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Acenaphthylene	S18-Ma24510	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Anthracene	S18-Ma24510	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Benz(a)anthracene	S18-Ma24510	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Benzo(a)pyrene	S18-Ma24510	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Benzo(b&j)fluoranthene	S18-Ma24510	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Benzo(g,h,i)perylene	S18-Ma24510	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Benzo(k)fluoranthene	S18-Ma24510	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Chrysene	S18-Ma24510	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	

Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Dibenz(a,h)anthracene	S18-Ma24510	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass
Fluoranthene	S18-Ma24510	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass
Fluorene	S18-Ma24510	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass
Indeno(1.2.3-cd)pyrene	S18-Ma24510	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass
Naphthalene	S18-Ma24510	CP	mg/L	0.00017	0.00018	<1	30%	Pass
Phenanthrene	S18-Ma24510	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass
Pyrene	S18-Ma24510	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
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

Authorised By

Nibha Vaidya	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 1 of 1

0312

Consigning Office: *Chertsey*Report Results to: *Simon Hay*

Invoices to:

Mobile:

Email: *Simon Hay*

@coffey.com

Phone:

Email:

@coffey.com

Project No: *SYDGE 2140142* Task No: *EMV10*
Project Name: *Grated* Laboratory: *Environ*
Sampler's Name: *CS* Project Manager: *Simon Hay*
Special Instructions:
Relevant agreements: Eurofins COF_ENAUABTF00952AA_MSA1; ALS COF_ENAUABTF00952AA_MSA2 and SGS COF_ENAUABTF00952AA_MSA3

Analysis Request Section

Environmental Division
Sydney

Work Order Reference

ES1808672



Telephone: +61-2-8784 8555

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)
	MW1	12/3	PM	Water	1A/M2V	ST
	MW2					
	MW3					
①	DUP					
	TRIP					
	Reinsertion					
	HA3-0.0-0.1			Soil	1A/1J	
	HA1-0.0-0.1					
	HA2-0.1-0.2					
	HA2-0.5-0.6					
	DUP2					
	TRIP 2					
	TRIP blank			Water	2A/1L	
	TRIP spike					

Solvent to ALS
(Center Simon
Argon sample)

No test
TRIP, only RE
in CCA

RELINQUISHED BY

Name: _____ Date: _____
Coffey Environments Time: _____
Name: _____ Date: _____
Company: _____ Time: _____

RECEIVED BY

Name: *UONG* Date: *21/3*
Company: *EURO* Time: *12.47pm*
Name: *SOS* Date: *22/3/10*
Company: *AS* Time: *1730*

Sample Receipt Advice: (Lab Use Only)

All Samples Received in Good Condition ☒
All Documentation is in Proper Order ☒
Samples Received Properly Chilled ☒
Lab. Ref/Batch No.

590364

*Container Type & Preservation Codes: P - Plastic, G - Glass Bottle, J - Glass Jar, V - Vial, Z - Ziplock Bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative, OP - Other Preservative

**Environmental****SAMPLE RECEIPT NOTIFICATION (SRN)****Work Order : ES1808672**

Client : COFFEY ENVIRONMENTS PTY LTD
Contact : MR SIMON HAY
Address : LEVEL 19, 799 PACIFIC HIGHWAY
Tower B - Citadel Tower
CHATSWOOD NSW, AUSTRALIA 2067

Laboratory : Environmental Division Sydney
Contact : Angelene Kumar
Address : 277-289 Woodpark Road Smithfield
NSW Australia 2164

E-mail : simon.hay@coffey.com
Telephone : ----
Facsimile : ----

E-mail : angelene.kumar@alsglobal.com
Telephone : +61 2 8784 8555
Facsimile : +61-2-8784 8500

Project : SYDGE2140142 Enviro Gosford
Order number :
C-O-C number : 0312
Site : 2017 Blanket Quote - Primary Samples
Sampler : LS

Page : 1 of 2
Quote number : EM2017COFENV0002 (EN/007/16)
QC Level : NEPM 2013 B3 & ALS QC Standard

Dates

Date Samples Received : 22-Mar-2018 17:30
Client Requested Due : 03-Apr-2018
Date :

Issue Date : 23-Mar-2018
Scheduled Reporting Date : **03-Apr-2018**

Delivery Details

Mode of Delivery : Carrier
No. of coolers/boxes : 1
Receipt Detail :

Security Seal : Not Available
Temperature : 17.6 - Ice Bricks present
No. of samples received / analysed : 1 / 1

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.

- *AU Certificate of Analysis - NATA (COA)	Email	simon.hay@coffey.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	simon.hay@coffey.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	simon.hay@coffey.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	simon.hay@coffey.com
- A4 - AU Tax Invoice (INV)	Email	simon.hay@coffey.com
- Chain of Custody (CoC) (COC)	Email	simon.hay@coffey.com
- EDI Format - ENMRG (ENMRG)	Email	simon.hay@coffey.com
- EDI Format - ESDAT (ESDAT)	Email	simon.hay@coffey.com



Environmental

CERTIFICATE OF ANALYSIS

Work Order : **ES1808672**
Client : **COFFEY ENVIRONMENTS PTY LTD**
Contact : MR SIMON HAY
Address : LEVEL 19, 799 PACIFIC HIGHWAY Tower B - Citadel Tower
CHATSWOOD NSW, AUSTRALIA 2067
Telephone : ----
Project : SYDGE2140142 Enviro Gosford
Order number :
C-O-C number : 0312
Sampler : LS
Site : 2017 Blanket Quote - Primary Samples
Quote number : EN/007/16
No. of samples received : 1
No. of samples analysed : 1

Page : 1 of 5
Laboratory : Environmental Division Sydney
Contact : Angelene Kumar
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61 2 8784 8555
Date Samples Received : 22-Mar-2018 17:30
Date Analysis Commenced : 23-Mar-2018
Issue Date : 03-Apr-2018 17:18



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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Total PAH reported as the sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenzo(a,h)anthracene and Benzo(g,h,i)perylene.



Analytical Results

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

Client sample ID

				TRIP	----	----	----	----
Client sampling date / time				19-Mar-2018 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1808672-001	-----	-----	-----	-----
Result				----	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	0.002	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	0.002	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
^ Total Xylenes	----	2	µg/L	<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	TRIP	----	----	----	----
Client sampling date / time					19-Mar-2018 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1808672-001	-----	-----	-----	-----
					Result	----	----	----	----
EP132B: Polynuclear Aromatic Hydrocarbons									
3-Methylcholanthrene	56-49-5	0.1	µg/L		<0.1	----	----	----	----
2-Methylnaphthalene	91-57-6	0.1	µg/L		<0.1	----	----	----	----
7.12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L		<0.1	----	----	----	----
Acenaphthene	83-32-9	0.1	µg/L		<0.1	----	----	----	----
Acenaphthylene	208-96-8	0.1	µg/L		<0.1	----	----	----	----
Anthracene	120-12-7	0.1	µg/L		<0.1	----	----	----	----
Benz(a)anthracene	56-55-3	0.1	µg/L		<0.1	----	----	----	----
Benzo(a)pyrene	50-32-8	0.05	µg/L		<0.05	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.1	µg/L		<0.1	----	----	----	----
Benzo(e)pyrene	192-97-2	0.1	µg/L		<0.1	----	----	----	----
Benzo(g,h,i)perylene	191-24-2	0.1	µg/L		<0.1	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.1	µg/L		<0.1	----	----	----	----
Chrysene	218-01-9	0.1	µg/L		<0.1	----	----	----	----
Coronene	191-07-1	0.1	µg/L		<0.1	----	----	----	----
Dibenz(a,h)anthracene	53-70-3	0.1	µg/L		<0.1	----	----	----	----
Fluoranthene	206-44-0	0.1	µg/L		<0.1	----	----	----	----
Fluorene	86-73-7	0.1	µg/L		<0.1	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.1	µg/L		<0.1	----	----	----	----
Naphthalene	91-20-3	0.1	µg/L		<0.1	----	----	----	----
Perylene	198-55-0	0.1	µg/L		<0.1	----	----	----	----
Phenanthrene	85-01-8	0.1	µg/L		<0.1	----	----	----	----
Pyrene	129-00-0	0.1	µg/L		<0.1	----	----	----	----
^ Sum of PAHs	----	0.05	µg/L		<0.05	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.05	µg/L		<0.05	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%		88.8	----	----	----	----
Toluene-D8	2037-26-5	2	%		87.6	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		85.7	----	----	----	----
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		87.6	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%		91.3	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%		92.5	----	----	----	----



Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	43	135
Anthracene-d10	1719-06-8	48	138
4-Terphenyl-d14	1718-51-0	48	144

Appendix F – QA/QC Data Validation

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DATA COMPLETENESS

Field Considerations

	Yes	No	Comments
Were all critical locations sampled?	☒	☐	Sampling was carried out in general accordance with the proposal. Sampling constraints are discussed in Section 5 of this report.
Were all critical depths sampled?	☒	☐	Sampling was carried out in general accordance with the proposal. Sampling constraints are discussed in Section 5 of this report.
Were the SOPs appropriate and complied with?	☒	☐	Coffey Standard Operating Procedures (SOP) are consistent with relevant guidelines and were complied with by field staff.
Was the sampler adequately experienced?	☒	☐	Samples were collected by trained and appropriately experienced staff members from Coffey.
Was the field documentation complete?	☒	☐	Daily field logs and records were compiled on-site by the Coffey staff members. Samples selected for analysis were scheduled on the COC provided in Appendix E.
Is a copy of the signed chain of custody form for each batch of samples included?	☒	☐	Copies are included in Appendix E.

Laboratory Considerations

	Yes	No	Comment
Were all requested samples analysed?	☒	☐	Samples scheduled on the COC were analysed for the analytes requested.
Were the laboratory methods appropriate?	☒	☐	Methods used were the recommended industry methods/ standards and/or NATA accredited methods
Were the laboratory methods adopted NATA endorsed?	☒	☐	Laboratory analytical reports are provided in Appendix E.

	Yes	No	Comment
Was the NATA Seal on the laboratory reports?	☒	☐	Laboratory analytical reports are provided in Appendix E.
Were the laboratory reports signed by an authorised person?	☒	☐	Laboratory reports were signed by authorised signatories using electronic signatures.
Were the laboratory LORs below the assessment criteria?	☐	☒	
Was sample documentation complete?	☒	☐	COCs were filled out correctly at time of dispatch and receipt, they are included with the sample receipt and analysis reports provided by the laboratories.
Were sample holding times complied with?	☒	☐	
Custody Seals intact (if used)	☒	☐	Not used
Attempt to chill was evident	☐	☒	The receiving laboratory did not receive the samples from Eurofins report 588255 chilled – the ice on which the samples were placed in the morning had melted by the time the samples were received at the laboratory.
Sample correctly preserved	☐	☒	The receiving laboratory did not receive the samples from Eurofins report 588255 chilled. The site history review did not identify significant sources of VOC within the investigation area as an area of environmental concern. Furthermore, PID readings ranged from 0.3 ppm to 1.7 ppm from these samples, indicating that VOCs were unlikely to be present and therefore volatile loss was likely to be minimal and unlikely to affect the outcome of the assessment.
Appropriate sample containers have been used	☒	☐	
Sample containers for volatile analysis received with minimal headspace	☒	☐	

COMPLETENESS CONCLUSION

	Yes	No	Comment
Was data adequately complete?	☒	☐	Based on the information in the previous sections, Coffey is of the opinion that the data was adequately complete for the objective of the works.

DATA COMPARABILITY

Field considerations

	Yes	No	Comment
Was there more than one sampling round?	☒	☐	Soil sampling was undertaken on the 22 nd , 23 rd , 27 th , 28 th , of February and 1 st , 6 th , and 19 th of March 2018. Groundwater and gas sampling was undertaken on 19 th of March 2018.
Were the same sampling methodology and SOPs used for all sampling?	☒	☐	
Was all sampling undertaken by the same sampler?	☒	☐	Soil sampling was undertaken by Lily Parchizadeh, an experienced geologist from Coffey and Luke Steller, an experienced environmental scientist from Coffey. Coffey SOPs for sampling were followed at all times during sampling. Groundwater and gas sampling was undertaken by Luke Steller from Coffey. Coffey SOPs for sampling were followed during sampling.
Were sample containers, preservation, filtering the same?	☒	☐	Containers used were supplied by the corresponding laboratories to provide appropriate sample storage.
Could climatic conditions (temperature, rainfall, wind) have influenced data comparability?	☐	☒ ☐	Coffey is of the opinion that the normal range of climatic conditions experienced over the sampling period would not significantly have affected data comparability.
Were the same types of samples collected (filtered, size fractions etc) for each media?	☒	☐	Samples were collected in laboratory supplied jars, bags and bottles.

Laboratory Considerations

	Yes	No	Comment
Were the same analytical methods used (including clean up)?	☒	☐	
Were the LORs the same?	☒	☐	LOR were generally the same.
Were the same laboratories used?	☒	☐	As discussed in Section 5 of the report.
Were the units reported the same?	☒	☐	

COMPARABILITY CONCLUSION

	Yes	No	Comment
Was data adequately comparable?	☒	☐	Overall, Coffey are of the opinion that the data was adequately comparable for the objective of the works.

DATA REPRESENTATIVENESS

Field Considerations

	Yes	No	Comment
Was appropriate media sampled?	☒	☐	Sampling was carried out in general accordance with the proposal, sampling constraints are discussed in Section 5 of the report.
Were all media identified sampled?	☒	☐	Sampling was carried out in general accordance with the proposal, sampling constraints are discussed in Section 5 of the report.
Were the samples properly and adequately preserved? This includes keeping the samples chilled, where applicable.	☐	☒	Samples were immediately placed in cooler boxes for transport where required, under COC conditions. Sample jars were sealed, with minimal remaining headspace. The majority of soil and groundwater samples were received at the laboratories in a chilled condition. Soil samples that were received by the laboratory un-chilled however did not exhibit hydrocarbon odours and registered negligible PID readings and hence were not assessed to significantly influence sample integrity.
Were the samples in proper custody between the field and reaching the laboratory?	☒	☐	See COC documentation for this information.
Were the samples received by the laboratory in good condition?	☒	☐	Laboratory sample receipts are provided in Appendix E.

REPRESENTATIVENESS CONCLUSION

	Yes	No	Comment
Was data adequately representative?	☒	☐	Coffey is in the opinion that the data were adequately representative for the objective of the works.

DATA PRECISION AND ACCURACY

Field considerations

	Yes	No	Comment
Were the SOPs appropriate and complied with?	☒	☐	Coffey Standard Operating Procedures (SOP) are consistent with relevant guidelines and were complied with by field staff.
Was sampling equipment calibrated?	☒	☐	Calibration certificates are provided in Appendix D.

Summary of Media Sampled

Media	Number of Primary Samples Analysed	Days Sampling	Dates Sampling	Number of Batches	Primary Laboratory Report References
Soil	46	7	22/02/2018 23/02/2018 27/02/2018 28/02/2018 01/03/2018 06/03/2018 19/03/2018	7	Eurofins 586434 Eurofins 586384 Eurofins 586989 Eurofins 589200 Eurofins 587720 Eurofins 588255 Eurofins 590364
Water	3	1	19/03/2018	1	Eurofins 578955

Field Duplicate Samples

The purpose of duplicate samples were to estimate the variability of a given characteristic or contaminant associated with a population.

How were the field duplicate samples collected?	Media	Methodology
	Soil	Field duplicate soil samples were collected from soil immediately adjacent to the primary sample by placing approximately equal portions of the primary sample into two (2) sample jars. Samples were labelled so as to conceal their relationship to the primary sample from the laboratory.
	Groundwater	Duplicated groundwater samples were collected by placing approximately equal portions of the primary sample in approximately equal portions into the appropriate sets of vials. Samples were labelled

<i>How were the field duplicate samples collected?</i>	Media	Methodology
	Soil	Field duplicate soil samples were collected from soil immediately adjacent to the primary sample by placing approximately equal portions of the primary sample into two (2) sample jars. Samples were labelled so as to conceal their relationship to the primary sample from the laboratory.
		so as to conceal their relationship to the primary sample from the laboratory.

<i>What field duplicate samples were analysed?</i>	Media	Primary Sample	Intra-lab Duplicates	Inter-lab Duplicates
	Soil	BH8 0.0-1.0	Dup6/Trip5	-
	Soil	BH9 0.0-1.1	Dup7/Trip6	-
	Soil	TP2 0.5-0.6	Dup1/Trip1	-
	Soil	HA1	Dup2	Trip2
	Groundwater	MW1	Dup	Trip

<i>What was the rate of duplicate soil samples analysed?</i>	Media	Analyte	No of Primary Samples Analysed	Intra-lab Duplicates Analysed		Inter-lab Duplicates Analysed	
				Quantity	Rate	Quantity	Rate
	Soil	Metals	33	8	>1:20	1	<1:20
		TRH	32	8	>1:20	1	<1:20
		BTEX	32	8	>1:20	1	<1:20
		PAH	33	8	>1:20	1	<1:20
<i>What was the rate of duplicate</i>	Media	Analyte	No of Primary	Intra-lab Duplicates Analysed		Inter-lab Duplicates Analysed	

groundwater samples analysed?			Samples Analysed	Quantity	Rate	Quantity	Rate
	Groundwater	Metals	3	1	>1:20	1	>1:20
	Groundwater	TRH	3	1	>1:20	1	>1:20
	Groundwater	BTEXN	3	1	>1:20	1	>1:20

	Media	Yes	No (Comment Below)
Were an adequate number of field duplicates analysed?	Soil	☐	☒
	Groundwater	☒	☐
Comments: Do to clerical error, a number of duplicate soil samples were not forwarded to the nominated secondary laboratory and were analysed as primary laboratory. These results have been included and are considered not to affect the outcome of the assessment			

Relative percent differences (RPDs) were calculated for each of the duplicate samples analysed. RPDs were calculated by dividing the difference between the primary sample and duplicate sample by the average of the two, as shown below:

$$RPD = \frac{(X_1 - X_2)}{(X_1 + X_2)/2} \times 100\%$$

Where: X_1 = Primary sample result; and

X_2 = Replicate sample result.

When calculating the RPDs, the following procedures were also considered	RPDs were only considered when a concentration was greater than 10 x LOR.
	In instances where results were greater than the LOR for the one (1) sample, but below LOR for the corresponding primary or duplicate sample, an RPD was not calculated.

Were RPD results within acceptable limits??	Media	Results Table Reference	Yes	No (Comment Below)
	Soil	Table T2	☐	☒
Comments RPDs were found to be within the acceptable limits with the exception of PAHs, select metals and select TRH fractions between primary and intra-lab and inter-lab duplicates, which were exceeded. It is considered likely that these RPD exceedances are attributed to the heterogeneity of the fill rather than sampling and analysis methodology and procedures. Furthermore, concentrations of the select analytes in duplicate samples were generally in the same order of magnitude and the concentrations of analytes in both the interlab and intralab duplicates did not exceed the adopted assessment criteria. Overall, these exceedances are not considered to have impacted the results of the investigation. RPDs for groundwater results were all considered to be acceptable.				

Were RPD results within acceptable limits??	Media	Results Table Reference	Yes	No (Comment Below)
	Groundwater	Table T6	☒	☐
Comments RPDs were within the acceptable range.				

Trip Blanks

Trip blanks assess the potential for cross contamination between transit from the site to the laboratory. Samples were analysed for volatile compounds. The trip blank samples were prepared by the primary laboratories, carried to the field unopened and subjected to the same preservation methods as the primary field samples.

What trip blank samples were analysed? What was the rate of trip blank samples analysed?	Media	Quantity Analysed	Sample ID	Rate
	Soil	4	TB1 TB2 TB3 TB4	4 total
	Groundwater	1	Trip Blank Water	1 total

Were an adequate number of trip blanks analysed to meet the data quality indicators?	Media	Yes	No (Comment Below)
	Soil	☒	☐
	water	☒	☐
Comments			

Were the trip blank results within acceptable limits?	Media	Results Table Reference	Yes	No (Comment Below)
	Soil	Table T3	☒	☐
	Groundwater	Table T7	☒	☐
Comments				

Trip Spikes

Trip spikes are assessed for the potential loss of volatile constituents from samples whilst in transit from the site to the laboratory. The trip spike samples were prepared by the primary laboratories, and contained a known concentration of volatile compounds.

What trip spike samples were analysed? What was the rate of trip spike samples analysed?	Media	Quantity Analysed	Sample ID	Rate
	Soil	4	TS1 (22/2/18) TS1 (23/2/18) TS3 TS4	4 total
	Groundwater	1	Trip Spike Water	1 total

Were an adequate number of trip blanks analysed to meet the data quality indicators?	Media	Yes	No (Comment Below)
	Soil	☒	☐
	water	☒	☐
Comments			

Were the trip spike results within acceptable limits?	Media	Results Table Reference	Yes	No (Comment Below)
	Soil	Table T3	☒	☐
	Groundwater	Table T7	☒	☐
Comments				

Rinsate Blanks

Rinsate blanks consist of pre-preserved bottles filled with laboratory prepared water that is passed over decontaminated field equipment and then collected in containers used for the sampling process. Rinsate blanks were preserved in a similar manner to the original samples. The rinsate blank was a check on decontamination procedures.

What rinsate blank samples were analysed? What was the rate of rinsate blank samples analysed?	Media	Quantity Analysed	Sample ID	Rate
	Soil	4	R1 (22/2/18) R1 (23/2/18) R3 R4	4 total

Were an adequate number of rinsate blank samples analysed?	Media	Yes	No (Comment Below)
	Soil	☒	☐
Comments			

Were the rinsate blank results within acceptable limits?	Media	Results Table Reference	Yes	No (Comment Below)
	Soil	Table T4	☒	☐
Comments Zinc in rinsate sample R1 (22/2/18) was detected marginally above the LOR of 0.005 mg/L at 0.0008 mg/L. Mercury was detected marginally above the LOR of 0.001 mg/L at 0.0003 mg/L and zinc was detected at 0.018 mg/L in rinsate sample R1 (23/2/18). Copper in rinsate sample R3 was detected at the LOR of 0.001 mg/L. Chromium was detected marginally above the LOR of 0.001 at 0.006 mg/L, copper was detected marginally above the LOR of 0.001 at 0.002 mg/L, nickel marginally above the LOR of 0.001 at 0.002 mg/L and zinc was detected at 0.027 in rinsate sample R4. This is not considered to affect the outcome of the investigation.				

Field QA/QC Statement

Field QA/QC was:	☒ Satisfactory ☐ Unsatisfactory ☐ Partially Satisfactory
Comments	

Laboratory Considerations

Methods

The laboratories conducted their own internal quality program for assessment of the repeatability of the analytical procedures and instrument accuracy under their NATA accreditation. This included analysis of laboratory blank samples, duplicate samples, spike samples, control samples and surrogate spikes. The laboratory QA/QC procedures and results are described within the laboratory reports presented in Appendix E.

Results

The laboratory internal QA/QC sample results were reviewed and were consistent with the laboratory's NATA guidelines. Furthermore, the adoption of the general advisory ranges for specific recoveries has been used to screen laboratory data. Where recoveries were outside these ranges the data was assessed in relation to specific laboratory comments, published industry 'norms' for specific parameters and/or the likely impact on the interpretation of the meaning of the results.

Laboratory QA/QC Statement

The laboratory internal QA/QC was:	☒ Satisfactory ☐ Unsatisfactory ☐ Partially Satisfactory
Comments	

DATA PRECISION AND ACCURACY CONCLUSION

	Yes	No	Comment
Was data adequately precise and accurate?	☒	☐	Overall, Coffey is of the opinion that the data were adequately precise and accurate for the objective of the works.

DATA USABILITY

- Data Directly Usable ☐
- Data Usable with the following considerations ☒
- Data Not Usable. ☐

Considerations

Variability in PAHs, select metals and TRH fractions was noted between primary and duplicate samples, however the results are considered to be representative of the conditions at the time of sampling. The variability was likely attributable to the heterogeneity of contamination distribution in the material sampled.

While one batch of samples was received by the laboratory not chilled, VOC was not identified as an area of environmental concern, hydrocarbon odours were not identified during sampling and field screening using a PID readings ranged from 0.3 ppm to 1.7 ppm in those samples, indicating that VOCs were unlikely to be present at significant concentrations at those locations and is therefore not considered to affect the outcome of this assessment.