DETAILED SITE INVESTIGATION

45 MITCHELL ROAD
BROOKVALE, NSW

Prepared for:
Dad & Dave's Brewery Pty Ltd

Date: 24 August 2020

Project Number: EP147_RP02

Metech
CONSULTING
Contamination Management Specialists

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Executive Summary

Metech Consulting was commissioned to undertake a Detailed Site Investigation at the property located at 45 Mitchell Road, Brookvale NSW, that is proposed for redevelopment as an artisan brewery.

The purpose of the investigation was to identify any constraints posed by the presence of contamination at the Site and to support the Development Application for the proposed works.

The investigation was undertaken by evaluating the previous preliminary site investigation (PSI, Metech 2020) and supplementary dangerous goods records, implementing a comprehensive sampling and analytical program to investigate identified areas of environmental concern and determining the significance of any identified contamination.

The PSI reported the history of the local area has been commercial / light industrial since the 1950/1960s with the current warehouse present at the property since the mid-1960s. Potentially contaminating activities were identified as:

- Petroleum products stored and used at the property in the underground storage tank and bowser (installed in the 1970s).
- The use of pesticides associated with the former market garden use.
- Off-site commercial activities (i.e. mechanics adjacent to the property and fabricators located up-gradient).

The dangerous goods records were consistent with PSI and did not identify any additional sources or areas of concern. Based on the potential sources of contamination, the conceptual site model determined that the primary exposure pathway to contamination that could pose a risk to harm to occupants of the Site was via the vapour intrusion pathway. Exposure pathways for offsite ecological and human health receptors were also considered.

A soil and groundwater investigation was undertaken to assess these risk pathways, which identified localised petroleum hydrocarbons in soil (one result above the adopted vapour intrusion screening criteria) adjacent to the former underground storage tank, outside of the warehouse footprint. Groundwater detected two metals above the adopted ecological screening criteria considered to be background regional concentrations unlikely to be related to the Site.

The detailed site investigation has determined that there is no unacceptable risk to occupants of the Site under the current commercial / industrial land use setting and the Site is suitable of the proposed development and intended use.

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1 Introduction

1.1 Preamble

Metech Consulting Pty Ltd has been commissioned to undertake a Detailed Site Investigation of the property located at 45 Mitchell Road, Brookvale (hereafter referred to as "the Site"). The Site is described as Lot 6 of Depositional Plan (DP) 30579 and occupies an area of approximately 556 m^2.

The location of the Site is shown in **Figure 1**, with the current layout shown in **Figure 2**.

The Site is located in a commercial / industrial setting and is occupied by a warehouse building with a partial mezzanine level fronting Mitchell Road. A Development Application (DA2020/0182) was submitted to Northern Beaches Council for use of the Site as an artisan food and drink premises (micro-brewery) and construction of signage.

To support the Development Application (DA2020/0182), a Preliminary Site Investigation (PSI) was undertaken by Metech Consulting Pty Ltd dated 23 July 2020, which identified three areas of environmental concern as follows:

- Petroleum products stored and used at the property in the former underground storage tank and bowser (installed in the 1970s).
- The use of pesticides associated with the former market garden use.
- Off-site commercial activities (i.e. mechanics adjacent to the property and fabricators located up-gradient).

Based on these findings, it was recommended that a Stage 2 Detailed Site Investigation be undertaken to assess whether these areas area affected by contamination to the extent that may affect the suitability of the Site for the proposed land use setting.

This investigation has been undertaken to identify any constraints posed by the presence of contamination at the Site and to support the Development Application (DA) for the proposed works.

This DSI has been undertaken in accordance with the requirements of the NSW contaminated land management framework, specifically:

- *Planning Guidelines: SEPP 55 (Remediation of Land) – Managing Land Contamination* (DUAP, 1998);
- *National Environment Protection (Assessment of Site Contamination) Measure 1999* (NEPC, 2013); and
- *Contaminated Land Guidelines: Consultants Reporting on Contaminated Land* (NSW EPA, 2020).

1.2 Objectives

The objectives of the investigation were to:

- Evaluate the potential contamination issues at the Site as identified in the PSI;

- Assess the type, extent and level of contamination that may exist at the Site;
- Determine whether the contamination (if present) poses any unacceptable risk to human health or the environment under the proposed land use;
- Determine whether remediation of contamination is required to make the Site suitable for the proposed land use setting; and
- Determine the suitability of the Site for the proposed development and land use setting.

1.3 Scope of Work

The following scope of work was undertaken to meet the objectives of the investigation:

- Review and evaluation of the information presented in the PSI.
- Review of SafeWork NSW information for the Site regarding storage of hazardous chemicals (not available for reporting in the PSI).
- A detailed site inspection to confirm the condition of the Site is consistent with what was reported in the PSI.
- Preparation of a sampling, analysis and quality plan to determine the requirements for the investigation works based on the outcomes of the preliminary site investigation and in accordance with the NSW EPA (1995) *Contaminated Sites: Sampling Design Guidelines*.
- Implementation of a comprehensive soil and groundwater investigation and analytical program.
- Evaluation of the findings of the investigation program with reference to the Tier 1 assessment criteria outlined in the NEPC (2013) *National Environment Protection (Assessment of Site Contamination) Measure 1999*.
- Assessment of the level of risk/impact (if any) of any identified contamination sources.
- Evaluation of the suitability of the Site for the proposed use as an artisan food and drink premises (micro-brewery).
- Preparation of this Detailed Site Investigation report in accordance with the requirements of *National Environment Protection (Assessment of Site Contamination) Measure 1999* (NEPC 2013).

2 Site Identification

2.1 Site Identification

Details of the Site are summarised below:

Table 2.1: Site Identification

Address:	45 Mitchell Road, Brookvale NSW (refer **Figure 1**)
Title:	Lot 6 DP 30579
Size:	556 m^2
Local Government Area:	Northern Beaches Council
Zoning:	IN1 General Industrial Warringah Local Environmental Plan (2011)
Current Land Use:	Commercial / Industrial
Proposed Land Uses:	Micro-brewery

2.2 Site Layout

A detailed inspection of the Site was undertaken by an appropriately qualified and experienced environmental scientist during the PSI (Metech 2020) on 13 July 2020 and 8 August 2020 during this investigation.

The primary purpose of the DSI inspection was to confirm if any additional evidence of potential contamination since the July inspection. The site inspection indicated the layout of the Site is similar to that reported in the PSI.

The Site is a rectangular-shaped parcel of land, oriented east-west. The western portion of the Site fronts Mitchell Road and is used for carparking. A warehouse building occupies the majority of the site area with a small rear yard along the eastern site boundary. The building is steel-framed and of brick construction, formed by a single-room ground floor factory/showroom (approx. 300 m^2) and a first-floor mezzanine office level (approx. 90 m^2).

Internal walls on the ground floor are limited to the partitioning of a staircase in north-west corner of the building, with a storage room / closet located on the ground floor beneath the internal staircase. The office level comprises an entryway, office / storage rooms and bathroom facilities. The interior of the building has a modern fit-out. The building materials were assessed to be in good condition. The ground surface of the warehouse is completely sealed with a concrete pavement on a raised concrete slab which was assessed to be in good condition with no notable degradation.

Access to the building is provided on the ground level by a roller door and adjacent pedestrian entry door, and via an external staircase which provides access from the driveway to the first floor office level. The ground surface beneath the external staircase was unpaved and void of any vegetation. Evidence of a former fuel dispenser pump was identified in the area beneath the external staircase, adjacent to the driveway.

At the time of inspection, the building was being used for storage of beer and brewery supplies. Little plant / equipment was present at the Site other than small brewing equipment and forklifts. A

shipping container used for storage was located along the northern wall of the building. It appeared that the Site was being operated predominantly on a retail / wholesale basis and manufacturing of beer did not appear to be undertaken. No significant chemical, oil, grease or degreaser storage was identified within the building.

A pedestrian door provides access to a small rear yard area (approx. 35m^2). The ground surface of this area is partially sealed with a worn concrete pavement and a small area of unsealed gravel. Two metal awnings partially shade the area on either side of the doorway. Two above-ground water tanks are located opposite each other in this area, each atop brick foundation, in the north-eastern and south-eastern corners of the Site

A thin pipe (approximately 400mm diameter) was identified in the unsealed gravel area, protruding approximately 30cm from the ground surface

Fibre-cement pipework, assessed to be potential asbestos-containing material (ACM) was identified in this area, as drainage from the building roof and protruding from the rear wall of the building towards the north-east corner. The pipework was assessed to be in sound condition, with no evidence of degradation or impact to surrounding ground surface.

The Site is surrounded by light industrial / commercial properties. Topographically, the area falls gently to the east with a slope of approximately 1%. The landform is consistent with the local topography. No evidence of the presence of any significant quantities of fill material was identified.

Drainage infrastructure was identified with drains across the front driveway of the Site and inside the building by the roller door. A former drain was identified in the rear yard area, filled with cement. Surface water is likely to be intercepted by drainage features.

The findings from the site inspection were generally consistent with those from the desktop review.

3 Site Condition and Surrounding Environment

3.1 Surrounding Uses

The land uses surrounding the Site are described in the table below.

Table 3.1: Surrounding Land Uses

North:	Commercial / industrial
South:	Commercial / industrial
East:	Commercial / industrial
West:	Mitchell Road, then commercial / industrial

3.2 Property Zoning

Property zoning information for the Site is described in the table below.

Table 3.2: Property Zoning

Property Zoning:	Zone IN1 General Industrial
Permissible Uses:	Without consent: Nil. With consent: Boat building and repair facilities; Depots; Freight transport facilities; Garden centres; General industries; Hardware and building supplies; Industrial retail outlets; Industrial training facilities; Light industries; Liquid fuel depots; Neighbourhood shops; Places of public worship; Roads; Storage premises; Take away food and drink premises; Timber yards; Vehicle body repair workshops; Vehicle repair stations; Vehicle sales or hire premises; Warehouse or distribution centres; Any other development not specified as permissible or prohibited.
Prohibited Uses:	Advertising structures; Agriculture; Air transport facilities; Amusement centres; Animal boarding or training establishments; Boat sheds; Camping grounds; Caravan parks; Cemeteries; Charter and tourism boating facilities; Commercial premises; Correctional centres; Crematoria; Eco-tourist facilities; Educational establishments; Entertainment facilities; Environmental facilities; Exhibition homes; Exhibition villages; Extractive industries; Forestry; Function centres; Health services facilities; Heavy industrial storage establishments; Heavy industries; Highway service centres; Home-based child care; Home businesses; Home occupations; Home occupations (sex services); Information and education facilities; Marinas; Mooring pens; Moorings; Open cut mining; Passenger transport facilities; Port facilities; Recreation facilities (major); Recreation facilities (outdoor); Registered clubs; Research stations; Residential accommodation; Restricted premises; Rural industries; Tourist and visitor accommodation; Veterinary hospitals; Water recreation structures; Wharf or boating facilities.

3.3 Topography and Hydrology

The Site is located within the Northern Beach Lagoon catchment. Greendale Creek is located approximately 240 metres north-east of the Site and is a tributary of Curl Curl Lagoon located 1.2km east of the Site.

The Site is located on a mid-hillslope and slopes approximately 6% to the east to south-east toward the rear boundary. Topography of the local area (<100m) is relatively level and a slight slope to the east towards Curl Curl Lagoon.

The Site is sealed with concrete. Surface water would be expected to flow towards surface water drainage infrastructure identified around the Site (refer **Section 2**).

3.4 Geology

The *1:100,000 Sydney Geological Series Sheet 9130* shows the Site and surrounding properties are underlain by *silty to peaty quartz sand, silt and clay*, *ferruginous and humic cementation in places* and *common shell layers*. Hawkesbury Sandstone is located approximately 200m north and south comprising *medium to coarse-grained quartz sandstone, very minor shale and laminate lenses*.

The *1:100 000 Sydney Soils Landscape Map 9130* identifies the Site to be located within the "disturbed terrain" landscape, which is characterised by level to hummocky terrain extensively disturbed by human activity including complete disturbance, removal or burial of soils. Variable relief and slopes include quarries, tips, areas of landfill, large cut and fill features with original vegetation usually cleared and weeds may be abundant.

Ground conditions encountered during this investigation is in **Table 3.1**. In general, fill materials were encountered in the west portion, outside the footprint of the building with deeper fill in the vicinity of the former underground storage tank.

Table 3.1: Site Geology

Depth (m)	Material Type	Description
0 - 0.2	Hardstand pavement	Concrete (increased thickness of 0.23 - 0.38m beneath factory)
0.2 - 0.5	Fill	Silty sand with gravels (west portion and up 1.9mbgl near UST)
0.35 – 1.2	Sandy Clay	Low plasticity clay with medium grained sand.
1.4 – 2.6	Clayey Sand	Medium grained sand with low plasticity clay.
2.6 – 6m	Sandy Clay	Light to medium sandy clay with medium grained sand.

3.5 Acid Sulfate Soils

Acid sulfate soils are typically formed in coastal area with an elevation of 5m AHD or less. The elevation of the Site is approximately10 AHD.

A review of the Warringah LEP (2011) identifies Class 4 acid sulfate soils at the Site. Class 4 acid sulfate soils indicates works more than 2 metres below natural ground surface and works by which the water table is likely to be lowered more than 2 metres below natural ground surface present an environmental risk.

3.6 Hydrogeology

A shallow, unconfined groundwater aquifer is present at the Site within the sandy clay unit with standing water levels ranging from 0.4 to 0.5m.

Groundwater contours could not be developed with the current data set, however it is anticipated groundwater flow would be to the north-east and east towards Greendale Creek.

A review of groundwater boreholes registered with NSW Department of Primary Industries was undertaken on 2 July 2020 as part of the PSI. The search identified three (3) groundwater bores installed within close vicinity of the Site (approximately 110m west and up-gradient).

The bores were installed for monitoring purposes to shallow depths between 4 and 4.5 metres below ground level (mbgl). The standing water levels were not reported. Subsurface soil conditions were described in drill logs as comprising fill as silty sand to 0.5mbgl with silty sand, sand and sandy clays at depths ranging from approximately 0.5 to 4.5 mbgl.

The closest down-gradient bores are several private spears installed approximately 660m to 800m to the east of the Site to depths of 2 to 4mbgl and used for domestic purposes. Approximately 860m to 900m south-east, several bores are installed to depths between 3 and 4mbgl and used for monitoring purposes.

4 Site History Evaluation

4.1 Introduction

The history of the Site and surrounding area was obtained from review of the recently completed PSI (Metech 2020) and SafeWork NSW Storage of Hazardous Chemicals records not available at the time of the PSI. Details of SafeWork NSW records are provided in **Section 4.2** with a summary of the PSI site history incorporating the SafeWork records included in **Section 4.3**.

4.2 Storage of Hazardous Chemicals Information

A search of the SafeWork NSW records on the storage of hazardous chemicals at the Site was undertaken and results provided in **Appendix A**. SafeWork NSW records (35/012164) for the Site reported:

- On 10 February 1977, Golden Fleece Petroleum, on behalf of Sydney Meat Supply, wrote to the Dangerous Goods Branch of the Department of Labour and Industry to gain approval to install a single petrol bowser and underground storage tank (UST) for the storage of super petrol (11,900 litre capacity).

- On 24 March 1977, the Dangerous Goods branch certified the premises complied with the requirements of the Inflammable Liquid Act 1915 with regards to construction for keeping the requested inflammable liquid and / or dangerous goods in quantity and nature specified.

- In March 1986, Dangerous Goods inspected the Site and certified agreement with the most recent licence form for storage of one 11,900 litre underground storage tank. The licensee was Sydney Meat Supply under licence no 12164.

- Two plans of the location of the tank and bowser were provided, both showed the tank in a similar location to the council information provided in the PSI.

4.3 Summary of Site History

The history of the Site and surrounding areas indicates the local area has been dominated by commercial / light industrial facilities for past 60 – 70 year with adjacent and upgradient (west and north-west) properties historically operated as auto repairs / panel beaters and steel fabricators further west.

The Site has been owned by various individual and companies with land use as follows:

- From 1919 to 1949 the Site was vacant and owned by several individuals (listed as market gardeners form 1940 to 1949) and leased to market gardeners from 1920 to 1937. The Site was likely used for market garden activities, consistent with surrounding properties at the time.

- From 1949 to 1961, the Site was vacant and owned by several companies with no evidence to of manufacturing or operations undertaken at the Site by these companies. The existing warehouse at the Site appears to have been constructed in the early 1960s.

- From 1961 to 1971, the Site was owned by a food wholesaler (French's Foods) who applied to use the site for fresh and frozen food wholesaling in 1961 and applied and received approval to install a petrol pump. Council reports indicate the petrol pump installation did not proceed.

- From 1971 to 1997, the Site was owned by several individuals, listed as butchers with the following occurring:
    - In 1973, Council approved the extension of the building and the use of the Site for the storage, preparation and distribution of meats operating as Sydney Meat Supply Brookvale Pty Ltd. The building extension is noted in the 1978 aerial photograph.
    - In January 1977, Council approved the installation of one 11,900 litre underground tank and electric bowser to be located at the front of the lot. Sydney Meat Supply approved Golden Fleece to undertake the installation works.
    - In February 1977, Golden Fleece on behalf of Sydney Meats applied for the dangerous goods licence for storage of super petrol in the tank, which was received in March 1977.
    - In 1986, the regulatory authority for dangerous goods in NSW inspected the Site and indicated compliance with the license.
- From 1997 to 2019, the Site was owned by two individuals with four leases noted on the title information (no information provided), although likely to be used for commercial purposes.
- In 2019, the Site was leased to the current tenant, Dad & Dave Brewing Pty Ltd who commissioned a tank investigation to identify if the underground storage tank remained beneath the car park. The investigation indicated the tank is unlikely to be present.
- The removal of the former UST has not been documented and there is no evidence of any past remediation and validation works associated with the former tank. The commercial uses of the Site between 1997 and 2019 are not known.

5 Conceptual Site Model

Based on the outcomes of the desktop review and detailed site inspection, a Conceptual Site Model (CSM) has been developed to outline the framework for identifying how the Site may have become contaminated and how potential receptors may be exposed to contamination either in the present or the future. The key elements of the CSM as outlined in NEPC (2013) include:

- Known and potential sources of contamination;
- Contaminants of concern;
- Mechanism of contamination;
- Potentially affected media;
- Human and ecological receptors;
- Potential for migration; and
- Exposure pathways.

Known and Potential Sources of Contamination

Past and present land use of the Site, adjacent and up-gradient properties were assessed to be generally limited to low-moderate risk, market gardening and commercial / light industrial use. The following potential sources of contamination were identified:

- Petroleum products stored and used at the Site in the former underground storage tank and bowser (installed in the 1970s).
- The use of pesticides associated with the former market garden use.
- Off-site commercial activities (i.e. mechanics adjacent to the Site and fabricators up-gradient).

Contaminants of Concern

Potential contaminants of concern typically associated with the potential sources of contamination are as follows:

- Heavy metals.
- Polycyclic aromatic hydrocarbons.
- Petroleum hydrocarbons.
- Volatile Organic Compounds
- Pesticides

Mechanism of Contamination

The primary mechanisms likely to have caused contamination at the Site are as follows:

- Application of pesticides to vegetation across the ground surfaces while the site was used for market gardening activities.
- The storage and use of a former underground storage tank and bowser, including the potential for leaks and spills of petroleum products.
- Migration of contamination from off-site properties, including mechanics and fabrication.

Potentially Affected Media

Potentially affected media at the Site would be surface and sub-surface soils across the Site within proximity to the identified potential sources of contamination.

Groundwater is likely to be present at the Site at relatively shallow depths (<5m bgl) and the nature of the contaminants of concern (liquid form) represent a likelihood of migration from the soil to underlying groundwater. The potential for groundwater to be affected by site-derived contamination is moderate.

Human and Ecological Receptors

The proposed land use is an artisan food and drink premise in association with a micro-brewery. Sensitive receptors would therefore include as staff and customers / visitors to the property, and workers during any construction or maintenance activities.

Greendale Creek is present approximately 240m north-east of the Site, which is also considered to be at risk from any significant site contamination if present.

Users of shallow groundwater for drinking water purposes from down-gradient registered groundwater bores / spears targeting shallow groundwater (<5mbgl) are considered to be at risk if significant groundwater contamination is present.

Potential for Migration

Contaminants generally migrate via a combination of windblown dusts, rainwater infiltration, groundwater migration and surface water runoff, which is affected by the following:

- The nature of the contaminants (solid/liquid and mobility characteristics);
- The extent of the contaminants (isolated or widespread);
- The location of the contaminants (surface soils or at depth); and
- The site topography, geology, hydrology and hydrogeology

The Site is located in an area of relatively level topography with a slope to the east and south-east. Considering the nature of the potential contaminants of concern (liquid form), the near-surface and sub-surface soils and groundwater are considered to be at the highest risk of being affected by any site-derived contamination.

Considering adjacent properties and the local area is commercial / industrial, land uses historically and currently include potentially contaminating activities (i.e. auto repairs, steel fabrication), it is possible that the Site could be affected by contamination migrating from off-site.

Exposure Pathways

Exposure pathways to any site-derived contamination are dependent on the type and characteristics of the contaminants of concern. Based on the potential contamination issues at the Site and the proposed future use as a micro-brewery, exposure pathways to any site-derived contamination for Site users could include:

- Inhalation via vapour intrusion; and
- Dermal contact.

Potential Areas of Environmental Concern (AECs) and Contaminants of Concern (COCs)

Based on the CSM developed for the Site, a summary of the potential areas of environmental concern and potential contaminants of concern are presented in **Table 5.1**.

Table 5.1: Potential Areas of Environmental Concern and Contaminants of Concern

Potential Source	Description	Potential Areas of Environmental Concern	Likelihood of Contamination	Potential Contaminants of Concern
Use and /or storage of petroleum products	Former underground storage tank and bowser installed at site.	Soils and groundwater in the vicinity of the UST	Moderate	• Heavy metals • Petroleum hydrocarbons
Use of pesticides	Pesticides associated with historic market gardens at the site and local area	Surface soils	Low	• Heavy metals • Organochlorine pesticides • Organophosphorus pesticides
Use of adjacent and nearby properties associated with light industrial operations (including auto repair and steel fabrication)	Migration of contaminants via movement of groundwater or vapour intrusion	Natural soils at depth and groundwater	Moderate	• Heavy metals • Petroleum Hydrocarbons • Volatile Organic Compounds • Polycyclic aromatic hydrocarbons

6 Data Quality Objectives

The Data Quality Objective (DQO) process is a systematic planning tool based on the scientific method for establishing criteria for data quality and for developing data collection designs. The process aims to eliminate unnecessary, duplicative or overly precise data whilst at the same time, ensuring the data collected is of sufficient quality and quantity to support defensible decision making.

The most efficient way to accomplish this goal is to establish criteria for defensible decision making prior to data collection, and to develop a data collection design based on these criteria. By using the DQO process to plan the investigation effort, Metech improved the effectiveness, efficiency and defensibility of the decision in a resource and cost-effective manner.

The DQO process consists of seven steps, which were designed to clarify the study objectives, define the appropriate type of data and specify tolerable levels of potential decision errors. The seven-step DQO process adopted for this investigation is summarised as follows:

- Step 1 – Defining the Problem. The first step in the DQO process is to 'define the problem' that has initiated the investigation.
- Step 2 – Identify the Decision. The second step in the process is to define the decision statements that the study will attempt to resolve.
- Step 3 – Identify Inputs to the Decision. In this step, the different types of information needed to resolve the decision statement are identified.
- Step 4 – Define the Study Boundaries.
- Step 5 – Develop a Decision Rule.
- Step 6 – Specify Limits on Decision Errors.
- Step 7 – Optimise the Design for Obtaining the Data.

6.1 Define the Problem

To determine whether there are any significant contamination issues at the Site that would pose a potential constraint to the proposed development and land use.

6.2 Identify the Decision

The relevant decision statements for this investigation are:

- Does contamination occur at the Site at concentrations that pose an unacceptable level of risk to human health and / or environmental receptors based on the current land use setting?

  And if so:

- What measures could be adopted to mitigate or manage the risk?

6.3 Identify the Inputs to the Decision

Key data required to resolve the project problem includes the concentrations of contaminants of concern in soil, fill materials (if present) at on -site locations, the pathways for contaminant movement and the location of sensitive receptors.

A robust sampling and analytical program was designed to inform the decision statements, which is outlined in **Section 7**.

6.4 Define the Boundaries of the Study

The boundary of the study are limited to the extent of the Site (refer **Figure 2**). The vertical extent of the study boundaries is limited to 6 metres below the ground surface.

The temporal boundaries of the study extend across the dates for which environmental data has been collected for the Site (August 2020).

6.5 Develop a Decision Rule

The decision rule is:

- If the concentrations of contaminants are below the adopted investigation levels, and the data is of acceptable quality, then contamination issues are unlikely to pose a constraint to use of the Site under a commercial land use setting and remedial action is not required.

- If the concentrations of contaminants are above the adopted investigation levels, and the data is of acceptable quality, then further risk assessment is required to quantify the level of risk, which may also require the implementation of remedial action mitigate risk to acceptable levels.

6.6 Specify Limits of Decision Errors

Two primary decision error-types may occur due to uncertainties or limitations in the project data set:

- A sample / area may be deemed to pass the nominated criteria, when in fact it does not. This may occur if contamination is 'missed' due to limitations in the sampling plan, or if the project analytical data set is unreliable.

- A sample / area may be deemed to fail the nominated criteria, when in fact it does not. This may occur if the project analytical data set is unreliable, due to inappropriate sampling, sample handling, or analytical procedures.

To minimise the potential for the decision errors above, a statistical evaluation of the data (including calculation of upper confidence limits) will be carried out where required.

In order to further evaluate the adequacy of the data, Data Quality Indicators (DQIs) have been established for precision, accuracy, representativeness, comparability and completeness. The DQIs for sampling techniques and laboratory analysis of collected samples identifies the acceptable level of error for the investigation. The DQOs will be assessed by reference to DQIs as follows:

- **Precision** - measures the reproducibility of measurements under a given set of conditions. The precision of the laboratory data and sampling techniques is assessed by calculating the Relative Percent Difference (RPD) of duplicate samples.

$$RPD\% = \frac{(C_o - C_d)}{C_o + C_d} \times 200$$

Where Co is the analyte concentration of the original sample

Cd is the analyte concentration of the duplicate sample

Metech adopts a nominal acceptance criterion of ±30% RPD for field duplicates and splits for inorganics and a nominal acceptance criterion of +50% RPD for field duplicates and splits for organics. However, it is noted that this will not always be achieved, particularly in heterogeneous soil or fill materials, or at low analyte concentrations.

- **Accuracy** - measures the bias in a measurement system. The accuracy of the laboratory data that are generated during this study is a measure of the closeness of the analytical results obtained by a method to the 'true' value. Accuracy is assessed by reference to the analytical results of laboratory control samples, laboratory spikes and analyses against reference standards.

  The nominal "acceptance limits" on laboratory control samples are defined as follows:

  - Matrix spikes – 70-130% recovery for metals / inorganics and 60-140% for organics
  - Laboratory Surrogates (Organics only) – 60 - 140% recovery.
  - Laboratory blanks - <PQL.

- **Representativeness** - expresses the degree which sample data accurately and precisely represents a characteristic of a population or an environmental condition. Representativeness is achieved by collecting samples in an appropriate pattern across the Site and by using an adequate number of sample locations to characterise the Site.

- **Comparability** - expresses the confidence with which one data set can be compared with another. This is achieved through maintaining a level of consistency in techniques used to collect samples, ensuring analysing laboratories use consistent analysis techniques and reporting methods.

- **Completeness** - is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is set at their being sufficient valid data generated during the study. If there is insufficient valid data, then additional data are required to be collected.

7 Sampling and Analytical Program

7.1 Assessment Strategy

The assessment strategy is designed to target each of the areas of environmental concern, that is to, ascertain the nature and extent of contamination within soils and groundwater derived from the Site. The strategy comprised a detailed evaluation of existing information for the Site and the implementation of a targeted investigation program that was designed in accordance with the requirements of the NSW EPA (1995) *Contaminated Sites: Sampling Design Guidelines*.

The investigation comprised:

- Drilling of seven (7) boreholes to depths of one (1) to 5.4 metres below ground surface to assess soil conditions.
- Drilling of two (2) of the seven (7) boreholes to a maximum depth of five (5) metres below ground surface for the installation of groundwater monitoring wells for the assessment of the shallow groundwater aquifer.
- Collection of representative soil samples from each borehole locations for assessment of the lateral and vertical extent of contamination.
- Collection of groundwater samples from the two (2) groundwater monitoring wells for the assessment of the contamination status of the shallow aquifer.

The investigation was designed to address areas of environmental concern identified during the PSI and additional information (outlined in **Section 4**) collected during this investigation to meet investigation objectives (outlined in **Section 1.2**).

The assessment strategy is detailed in **Table 7.1** The investigation locations area shown in **Figures 4** and **5**.

Table 7.1: Assessment Strategy

Area of Environmental Concern	Description of Land Use	Media	Investigation Strategy	Analytical Program	Details/Constraints
Use and /or storage of petroleum products	Former inderground storage tank and bowser installed at site.	Soil and Groundwater	• Four bore holes (BH2, BH2A, MW1 and MW2) installed to assess soil conditions adjacent to and downgradient of the UST and bowser. • Two groundwater monitoring wells (MW1 and MW2) installed and sampled to assess groundwater adjacent and downgradient of the UST and bowser.	Petroleum Hydrocarbons Heavy metals Polycyclic Aromatic Hydrocarbons	Refusal at 1.9mbgl on concrete in BH2 where elevated PID readings indicated contamination triggered the installation of adjacent BH2A to assess deeper soils to 6mbgl.
Use of pesticides	Pesticides associated with historic market gardens at the site and local area	Soil	• Two bore holes installed to assess near surface soils directly beneath hard stand cover (BH1A and BH3).	Heavy metals Organochlorine pesticides Organophosphorus pesticides	Refusal at 0.6mbgl on brick structure triggered the installation of BH1A and sample collection of near surface soils directly below hard stand cover.
Use of adjacent and nearby properties associated with light industrial operations (including auto repair and steel fabrication)	Migration of contaminants via movement of groundwater or vapour intrusion	Natural soils at depth and groundwater	• Two boreholes (BH1 and BH1A) on upgradient site boundary.	Petroleum Hydrocarbons Heavy Metals Volatile Organic Compounds (including BTEXN) Polycyclic Aromatic Hydrocarbons	Refusal at 0.6mbgl on brick structure triggered the installation of BH1A and assessment of soils to 5.4mbgl.

Details of the assessment methodology are outlined in **Section 7.2**.

7.2 Assessment Methodology

7.2.1 Preliminaries

Prior to the commencement of intrusive works, details of underground services were identified by the dial before you dig search. A certified underground cable location was also used to provide clearance of all underground infrastructure prior to drilling.

Underground and above ground services are present at the Site, however did not constrain the availability of investigation locations.

7.2.2 Soil Sampling Methodology

The primary contaminants of concern at the Site have been assessed to be volatile and semi-volatile petroleum hydrocarbons and therefore the adopted sampling methodology was implemented to minimise sample disturbance as far as practicable. Details of the type of soil sampling methodology are described as follows:

Hand auger

Considering the proximity of investigations to underground services, all boreholes were initially advanced to a depth of approximately 1 mbgl using a hand auger. Samples were collected from the upper metre of the soil profile for laboratory analysis. Samples were collected via the contents of the auger being transferred directly to the sample container. The hand auger was appropriately decontaminated between sampling locations.

Direct Push-tube Sampling

Direct push-tube sampling using a limited access Geoprobe was undertaken at all investigation locations. The adopted methodology minimises the potential loss of volatile contaminants, minimises the potential for cross-contamination of samples and allows for a detailed visual inspection of the geological soil profile.

The push-tube was advanced until the targeted depth or refusal (generally on bricks structures or concrete). Samples were collected directly from the push-tube with minimal disturbance using a stainless-steel trowel and were immediately transferred to an appropriate sample container. Samples were immediately placed in ice filled eskies. All sample contact equipment was appropriately decontaminated between samples and locations.

Once each sample was collected, it was immediately placed into an ice filled esky. Samples were kept secure and chilled during the field program and subsequent transportation to the laboratory. Sample receipt advice describing the condition of the sample on receipt is provided in **Appendix E**.

Field Screening

Soil samples were screened on site during works using a photo-ionisation detector (PID) to assess the potential presence of VOCs such as may be associated with light fraction petroleum hydrocarbon contamination.

Samples obtained for PID screening were placed in a sealed plastic bag for a period of approximately 5 minutes to equilibrate, prior to a PID being attached to the bag. Readings were monitored for a period of approximately 1 minute or until values stabilised and the stabilised/highest reading was recorded.

PID screening results were recorded on the borehole logs.

Soil Logging

Soil logging was carried out in general accordance with the United Soil Classification System (USCS) by a suitably experienced and qualified environmental scientist. Features such as seepage, discolouration, staining, odours and other indicators of contamination were noted. Soil borehole logs are presented in **Appendix B**.

7.2.3 Groundwater Sampling Methodology

Groundwater Well Construction

A total of two (2) groundwater monitoring wells were installed to enable collection of representative groundwater samples for analysis.

Boreholes were installed with the use of a Geoprobe to a maximum depth of 6mbgl for the monitoring wells. The monitoring wells were constructed from Class 18 UPVC (50mm) screen, generally 2-3m from the base of the well, and casing from surface, with a filter pack and bentonite seal above the slotted section. The annulus of the bore was then grouted to the ground surface (refer **Appendix B** for full construction details). Wells were finished with a lockable cap and a lockable gatic cover.

Both monitoring wells were developed, immediately after installation, to ensure removal of fine particles from the screened interval, to stabilise the annular filter and to maximise the hydraulic efficiency of the monitoring well. A stainless-steel bailer, (decontaminated between each use), was used to develop the wells via surging and purging. Well development continued until the turbidity of the water improved or the well became dry. The wells were allowed to stabilise for 7 days after development, prior to groundwater sampling.

Water Level Measurement

Water level measurements were undertaken prior to purging of each well. All level measurements were carried out from a measuring point marked on the casing with a permanent marker to ensure consistent measurements over time.

The groundwater levels in each well were measured within the same day (11 August 2020) within a short a period as possible to enable a consistent comparison of water levels. Measurements were undertaken using an electronic interface probe, which was decontaminated between wells.

The following measurements were also taken and recorded on the field data sheet:

- Thickness of any phase separated hydrocarbons (PSH) (if present).
- Static water level relative to the top of casing; and

- Total depth of well.

Well Purging

Purging and sampling of wells was undertaken in order of least likely contaminated well to most likely contaminated well to minimise the potential for cross-contamination. Purging was undertaken using a new, clear disposal bailer. Measurement of the following field parameters were undertaken during well purging:

- pH;
- electrical conductivity (EC);
- temperature;
- dissolved oxygen (DO); and
- redox potential (Redox).

Purging of monitoring wells continued until stable water parameters were achieved or until the bore was purged dry. The water parameters were considered to have stabilised when successive measurements were found to vary by less than +/- 10%.

Groundwater Sampling

Both wells were sampled immediately following well purging. Disposable bailers were used to sample the monitoring wells, using flow restrictors for samples collected for volatile analysis. Care was taken to minimise disturbance of the groundwater as far as practicable during sampling.

Groundwater samples were collected in sample containers of appropriate composition, pre-treated in a manner appropriate for the scheduled laboratory analysis.

Once each sample was collected, it was immediately placed into a ice filled esky. Samples were kept secure and chilled during the field program and subsequent transportation to the laboratory. Sample receipt advice describing the condition of the samples on receipt is provided in **Appendix E**.

7.2.4 Analytical Program

All analysis was undertaken in accordance with the relevant standards as defined by NEPM (NEPC 2013). Eurofins Environment Testing Australia was the primary laboratory, NATA-accredited for all required analytical methods.
The analytical program has been summarised in **Table 7.2**.

Table 7.2: Analytical Program

Sample Type	Analytes Tested
Soil	TRH: 9 primary soil samples (plus 1 QA/QC sample) BTEXN: 9 primary soil samples (plus 1 QA/QC sample) PAH: 9 primary soil samples (plus 1 QA/QC sample) Metals: 5 primary soil samples OCP / OPP: 2 primary soil samples
Groundwater	TRH: 2 primary groundwater samples (plus 1 QA/QC sample) BTEXN: 2 primary groundwater samples (plus 1 QA/QC sample) PAH: 2 primary groundwater samples (plus 1 QA/QC sample) Heavy metals: 2 primary groundwater samples (plus 1 QA/QC sample)

7.2.5 Data Quality Indicators

The Data Quality Indicators (DQIs) that will be used to evaluate the data are outlined in **Table 7.3**.

Table 7.3: Quality Assurance and Quality Control Program

Data Quality Indicator	Frequency	Acceptance Criteria
Precision		
Blind duplicates (organics)	1 in 20 samples	< 50% RPD
Blind duplicates (inorganics)	1 in 20 samples	< 30% RPD
Accuracy		
Surrogate spikes	All Organic Samples	60 – 140%
Field blanks	1 per Batch	<PQL
Matrix spikes	1 per Batch	60 – 140%
Laboratory blanks	1 per Batch	<PQL
Representativeness		
Sampling appropriate for media and analytes	All Samples	All Samples
Samples extracted and analysed within holding times	All Samples	All Samples
Completeness		
Soil description and COCs completed and appropriate	All Samples	All Samples
Appropriate documentation	All Samples	All Samples
Satisfactory frequency and result for QC samples	All Samples	All Samples
Comparability		
Standard operating procedures used for sample collection and handling	All Samples	All Samples

Data Quality Indicator	Frequency	Acceptance Criteria
NATA-accredited analytical methods used for all analytes	All Samples	All Samples
Consistent field conditions, sampling staff and laboratory analysis	All Samples	All Works
Limits of reporting appropriate and consistent	All Samples	All Samples

8 Assessment Criteria

8.1 Soil Investigation Levels

The purpose of any contaminated land assessment is to determine the human health and ecological risks associated with the presence of site contamination and to inform any remediation or management plan to make the site fit for the current or proposed land use. The appropriate use of investigation levels is an integral component of the assessment process.

The *National Environment Protection (Assessment of Site Contamination) Measure 1999* (NEPC 2013) outlines the framework for implementing a Tier 1 risk assessment using investigation and screening levels. A Tier 1 assessment is a risk-based analysis comparing site data with generic investigation and screening levels for various land uses to determine the need for further assessment or development of an appropriate management strategy.

NEPC (2013) provides both environmental investigation / screening levels (EILs/ESLs) and health-based investigation / screening levels (HILs/ HSLs) for the following land use settings:

- **HIL A**: Residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake, [(no poultry]), includes children's day care centres, preschools and primary schools.
- **HIL B**: Residential with minimal opportunities for soil access, includes dwellings with fully and permanently paved yard space such as high-rise buildings and flats.
- **HIL C**: Public open space such as parks, playgrounds, playing fields (eg. ovals), secondary schools and footpaths.
- **HIL D**: Commercial/industrial such as shops, offices, factories and industrial sites.

The HILs have been derived for the above land use scenarios based on long-term exposures for the most sensitive receptor populations exposed. The HILs are therefore considered to be protective of exposures to other receptor populations.

Based on the CSM developed for the Site and in comparison to the CSM's developed for the above four (4) generic land use settings (NEPC 2013), it has been determined that the most appropriate land use setting for the Site that is to be adopted for the tier 1 risk assessment is **HIL D – Commercial/Industrial such as shop, offices, factories and industrial sites ("Commercial/Industrial D")**.

Table 8.1: Site Assessment Criteria - Soil

Parameter	Ecological Criteria[1,2] (mg/kg)	Human Health Criteria[3, 4] (mg/kg)
Arsenic	160	3000
Cadmium	3	900
Chromium	310 [5]	3600
Copper	140[5]	240,000
Lead	1,800	1,500
Mercury	1	180
Nickel	55 [5]	6,000

Parameter	Ecological Criteria[1,2] (mg/kg)	Human Health Criteria[3, 4] (mg/kg)
Zinc	110[5]	400,000
TRH F1	215	260
TRH >C_{10}-C_{16}	170	1,000
TRH F2 >C_{10}-C_{16} less napthalene	170	1,000
TRH F3 >C_{16}-C_{34}	1,700	3,500
TRH F4 >C_{34}-C_{40}	3,300	10,000
Benzene	75	3
Toluene	135	-
Ethylbenzene	165	-
Total xylenes	180	230
Napthalene	370	-
Benzo(a)pyrene	0.7	-
Benzo(a)pyrene TEQ	-	40
Total PAH	-	4,000
HCB	-	80
Heptachlor	-	50
Aldrin and Dieldrin	-	45
DDE + DDT + DDD	-	3,600
DDT	640	-
Endosulfan	-	2,000
Chlordane	-	530
Endrin	-	100
Methoxychlor	-	2,500
Toxaphene	-	160
Chlorpyriphos	-	2,000

1 Environmental Investigation Levels – Commercial and Industrial (NEPC 2013). Inorganic compounds.
2 Environmental Screening Levels – Commercial and Industrial (NEPC 2013). Organic compounds. 'COARSE' soil texture criteria adopted to account for 'Sand' geological conditions.
3 Health-based Investigation Levels – Commercial Industrial D (NEPC 2013).
4 Health screening Levels – Management limits, 'Coarse' soil texture for Commercial and Industrial (NEPC 2013).
5 The ACL for soils with a CEC of 5 $cmol_c$/kg and clay content 1 % (most conservative) have been adopted.

8.2 Groundwater Investigation Levels

To determine the most appropriate groundwater guidelines values, the following considerations have been made:

- **Aquatic Ecosystems**: The closest surface water receptor is Greendale Creek located 240m north-east of the Site, a tributary of Curl Curl Lagoon located 1.2km east of the Site. This freshwater creek would be classed as beneficial receptor of groundwater and should be protected.

- **Human Receptors (Vapour Intrusion)**: The Site is an operational commercial facility. Workers within this premise may potentially be at risk via vapour intrusion pathway from contaminated groundwater that may exist beneath the Site. Occupants of the adjacent properties may also be at risk of harm from any site-derived contamination via the vapour intrusion pathway.

- **Human Receptors (Drinking Water)**: Registered bores have been identified within the vicinity (500m radius) of the Site or downgradient of the Site (660m east or greater). Although the site and surrounding properties are used for commercial purposes and groundwater abstraction for drinking water purposes is unlikely, it is possible that the groundwater aquifer beneath the Site is connected to groundwater down-gradient where registered bores / spears are used for abstracting groundwater for drinking water purposes. The Site groundwater is therefore, considered as a beneficial drinking water resource.

Based on the above factors, the groundwater assessment criteria to be adopted for evaluation of potential risks of harm posed by any identified groundwater contamination at the Site with be environmental (95% protection level) and human health (vapour intrusion and drinking water) guideline values.

Table 8.2: Site Assessment Criteria - Groundwater

Parameter	Ecological Criteria[1] (µg/L)	Human Health Criteria[2] (µg/L)
Arsenic	13	10
Cadmium	0.2	2
Chromium	1 [4]	50
Copper	1.4[4]	2000
Lead	3.4	10
Mercury	0.06	1
Nickel	11 [4]	20
Zinc	8[4]	-
TRH F1	-	6,000[3]
Benzene	950	1 / 5,000[3]
Toluene	-	800
Ethylbenzene	-	300
Total xylenes	200 (m&p-xylene) / 350 (o-xylene)	600
Napthalene	16	-
Benzo(a)pyrene	-	0.01

1 Groundwater Investigation Levels (GILs) – NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999. Freshwater trigger values for slightly-moderately disturbed systems (95% protection levels).

2 Groundwater Investigation Levels (GILs) – NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999. Drinking water trigger values.

3 Health Screening Levels (HSLs) – Commercial Industrial D for 2 to <4mbgl (NEPC 2013). It is noted that the groundwater levels are generally present at a depth of 1mbgl. Therefore these criteria are used for initial screening purposes only.

9 Results

9.1 Field Observations

Subsurface conditions across the Site indicated fill materials in the west portion of the Site, outside of the warehouse footprint with no fill beneath the warehouse. The general geological profile beneath the Site is included in **Section 3.4**.

Key observations during the field investigation included:

- Fill as silty sand and clayey sand in the bore adjacent to the tank (BH2) is likely backfill material used during the installation of the tank. The fill extended to 1.9mbgl where bore refusal occurred on concrete (potentially a former tank anchor). From depths of 0.4 to 1.9mbgl, a hydrocarbon odour was noted. Field screening with a PID confirmed the presence of petroleum hydrocarbon contamination (1021ppmv) at this location.

- The adjacent bore (BH2A), installed to assess deeper soils following refusal at BH2, indicated fill to approximately 0.7mbgl underlain by natural sandy clays and clayey soils. A hydrocarbon odour was noted during drilling at 3mbgl in the natural soils. Field screening with a PID were elevated (<50ppmv), however no odour was detected at 4mbgl or greater with similar screening results.

- Groundwater was encountered at approximately 1mbgl and no hydrocarbon odours were reported during well installation or groundwater sampling.

9.2 Soil Analytical Results

Analytical results are provided in summary tables included in **Appendix D**, with the laboratory certificates provided in **Appendix E**. The sampling locations are shown on **Figures 4** and **5**.

The results for the analytical program are summarised as follows:

- Concentrations of heavy metals were reported to be below adopted environmental investigation levels (EILs) and the human health investigation levels (HILs) in all samples, with the exception of one result for zinc that exceeded the EIL.

- Concentrations of polycyclic aromatic hydrocarbons were reported to be below both the adopted EILs and the HILs in all soil samples.

- Concentrations of total recoverable hydrocarbons, benzene, toluene, ethylbenzene and xylenes were below the adopted EILs, HILs and HSLs in all soil samples with the exception of TRH F1 in one result that exceeded the vapour intrusion HSL (450m/kg compared to 260mg/kg).

- Concentrations of organochlorine pesticides (OCP) and organophosphorus pesticides (OPP) were below the adopted EILs and HILs.

9.3 Groundwater Quality Parameters

Groundwater quality parameters were recorded at the Site as detailed in **Table 9.1.**

Table 9.1: Water Quality Parameters

ID	Depth to Water	pH	Temp (^{0}C)	Conductivity (µS/cm)	DO (ppm)	Redox (mV)	Parameters Stabilised?	Well Purged Dry?
MW1	0.405	5.83	18.5	82	5.71	99.3	Yes	No
MW2	0.524	5.23	18.9	186	3.49	-59.7	Yes	No

The water quality parameter results show:

- Groundwater temperatures and pH values (5.23 and 5.83) were consistent in groundwater from each well.
- Electrical conductivity was 82 and 186 µS/cm indicating freshwater conditions.
- Dissolved oxygen concentrations were variable, indicating aerobic conditions.
- Redox potential levels varied between groundwater in both of the wells.

9.4 Groundwater Analytical Results

Analytical results are provided in summary tables in **Appendix D**, with the laboratory certificates provided in **Appendix E**.

The results from the groundwater analytical program are summaries as follows:

- Phase separated hydrocarbons (PSH) was not identified in either of the wells;
- Concentrations of heavy metals were reported to be below HSL, HILs and EILs in both samples with the exception of copper in both wells (QC sample of MW1) and zinc in MW2 above the adopted EILs.
- Concentrations of polycyclic aromatic hydrocarbons were reported below the laboratory detection limits, the adopted EILs and HILs in both groundwater samples, noting the benzo(a)pyrene limit of detection is higher than the drinking water HIL.
- Concentrations of Total recoverable hydrocarbons, benzene, toluene, ethylbenzene and xylenes were below the laboratory detection limits and the adopted EILs, HILs and HSLs in both groundwater samples.

9.5 QA/QC Results

The QA/QC results were assessed against the pre-determined DQIs as shown in **Table 9.2**.

Table 9.2: Quality Assurance / Quality Control Results

Data Quality Indicator	Result	DQI Achieved
Precision		
Duplicates (inorganics)	<30% RPD	Partial
Duplicates (organics)	<50% RPD	Yes
Accuracy		
Laboratory Blanks	<PQL	Yes
Representativeness		
Sampling appropriate for media and analytes	All Samples	Yes
Samples extracted and analysed within holding times	All Samples	Yes
Completeness		
Soil description and COCs completed and appropriate	All Samples	Yes
Appropriate documentation	All Samples	Yes
Satisfactory frequency and result for QC samples	All Samples	Yes
Comparability		
Standard operating procedures used for sample collection and handling	All Samples	Yes
NATA-accredited analytical methods used for all analytes	All Samples	Yes
Consistent field conditions, sampling staff and laboratory analysis	All Samples	Yes
Limits of reporting appropriate and consistent	All Samples	Yes

Relative percent differences between the primary and duplicate results for copper (133%) and zinc (46%) in the groundwater primary/duplicate pair exceeded the acceptance criteria due to low analyte concentrations that exaggerate the apparent difference. The exceedance do not affect the data set.

Based on the results of the QA/QC program as outlined above, the data produced from the assessment works are considered to precise, accurate, representative, complete and comparable.

Therefore the data is considered to be of an acceptable quality upon which appropriate conclusions and decisions can be made with respect to the environmental conditions at the Site.

10 Discussion

Section 6.2, identified the key problem for which this investigation sought to assess, which was to determine whether there are any significant contamination issues at the Site that would pose a potential constraint to the proposed development and land use.

In accordance with the decision-making process for assessing urban redevelopment sites detailed in DEC (2006) and the pre-determined project DQOs, the decisions required to be made are discussed below.

Does contamination occur at the Site at concentrations that pose an unacceptable level of risk to human health and / or environmental receptors based on the current land use setting?

And if so:

What measures could be adopted to mitigate or manage the risk?

Key findings from this assessment indicate petroleum hydrocarbons, as TRH F1 was identified marginally above the adopted screening criteria in one result at a depth of 0.9mbgl adjacent to the former underground storage tank. No petroleum hydrocarbons were detected in the deeper sample at 3mbgl or any other results across the Site. As the underground storage tank and bowser have been removed, there is unlikely to be an ongoing source of contamination. There is no evidence of past remediation and validation associated with the tank and the result indicates residual contamination localised to this area of the Site. Given the contamination is limited and present outside the building footprint, vapour intrusion is considered to be negligible.

No soil contamination associated with the potential use of pesticides or offsite commercial / industrial activities were identified.

Groundwater was assessed at locations adjacent to and down-gradient of the underground storage tank (east and north-east) and did not identify any contamination associated with the storage and use of petroleum hydrocarbons. Additionally, the groundwater results were below the adopted vapour intrusion and drinking water screening levels indicating no exposure pathways to human receptors.

Detections of zinc and copper in groundwater were reported above the adopted ecological screening criteria for freshwater ecosystems, however the concentrations are likely regional background levels, not associated with Site activities.

The low levels of contamination do not pose an unacceptable risk to human health or environmental receptors based on the current land use setting and no mitigation or management measures are required.

11 Conclusions

Metech Consulting was commissioned to undertake a Detailed Site Investigation of the property located at 45 Mitchell Road, Brookvale NSW. The Site is proposed to be redeveloped as a micro-brewery.

The objectives of the assessment were to:

- Evaluate the potential contamination issues at the Site as identified in the PSI and supplementary information;
- Assess the type, extent and level of contamination that may exist at the Site;
- Determine whether the contamination (if present) poses any unacceptable risk to human health or the environment under the proposed land use;
- Determine whether remediation of contamination is required to make the Site suitable for the proposed land use setting; and
- Determine the suitability of the Site for the proposed development and land use setting.

A summary of the key findings from the assessment are as follows:

- Supplementary information from SafeWork NSW regarding tank installation was consistent with the PSI and the three areas of environmental concern identified were assessed as part of this investigation:
    - Potential use of pesticides during market gardening at the Site;
    - A former underground storage tank and bowser installed at the Site in the 1970s; and
    - Potentially contaminating off-site commercial activities.
- The conceptual site model that was developed for the Site determined that the primary exposure pathway to contamination that could pose a risk to harm to occupants of the Site was via the vapour intrusion pathway. Exposure pathways for offsite ecological and human health receptors were also assessed.
- A soil and groundwater investigation was undertaken to assess these risk pathways, which identified localised petroleum hydrocarbons in soil (one result above the adopted vapour intrusion screening criteria) adjacent to the former underground storage tank, outside of the warehouse footprint. Groundwater detected two metals above the adopted ecological screening criteria considered to be background regional concentrations unlikely to be related to the Site.

Based on the results of this investigation, it is concluded that there no unacceptable risk to occupants of the Site under the current commercial / industrial land use setting and the Site is suitable of the proposed development and intended use.

12 References

Contaminated Land Management Act 1997.

Department of Urban Affairs and Planning (1998) *Planning Guidelines: SEPP 55 (Remediation of Land) – Managing Land Contamination*

Environmental Planning and Assessment Act 1979.

Metech Consulting (2020*) Preliminary Site Investigation 45 Mitchell Rd Brookvale NSW 2100*.

National Environment Protection Council (NEPC 2013) *National Environment Protection (Assessment of Site Contamination) Measure 1999*.

NSW Environment Protection Authority (EPA 2020) *Contaminated Land Guidelines: Consultants Reporting on Contaminated Land.*

NSW Environment Protection Authority (EPA 1995) *Contaminated Sites: Sampling Design Guidelines*.

NSW Office of Environment and Heritage (OEH 2016) *SALIS: NSW Soil & Land Information System*.

Protection of the Environment Operations Act 1997.

Warringah Local Environmental Plan (2011).

13 Limitations

Metech prepared this report in accordance with the scope of work as outlined in our proposal dated 23 July 2020 and in accordance with normal prudent practice and by reference to applicable environmental regulatory authority and industry standards, guidelines and assessment criteria in existence at the date of this report and any previous site investigation and assessment reports referred to in this report.

This report should be read in full and no excerpts are to be taken as representative of the findings. No responsibility is accepted by Metech for use of any part of this report in any other context.

Subsurface conditions can vary across a particular site and cannot be exhaustively defined by the investigations carried out prior to this report. It is unlikely therefore that the results and estimations expressed or used to compile this report will represent conditions at any location removed from the specific points of sampling.

Site conditions may change over time. This report is based on conditions encountered at the Site at the time of the report and Metech disclaims responsibility for any changes that may have occurred after this time.

The conclusions presented in this report represent Metech's professional judgement based on information made available during the course of this assignment and are true and correct to the best of Metech's knowledge as at the date of the assessment.

Metech did not independently verify all of the written or oral information provided to Metech during the course of this investigation. While Metech has no reason to doubt the accuracy of the information provided to it, the report is complete and accurate only to the extent that the information provided to Metech was itself complete and accurate. Metech assumes no liability for any inaccuracies in or omissions to that information.

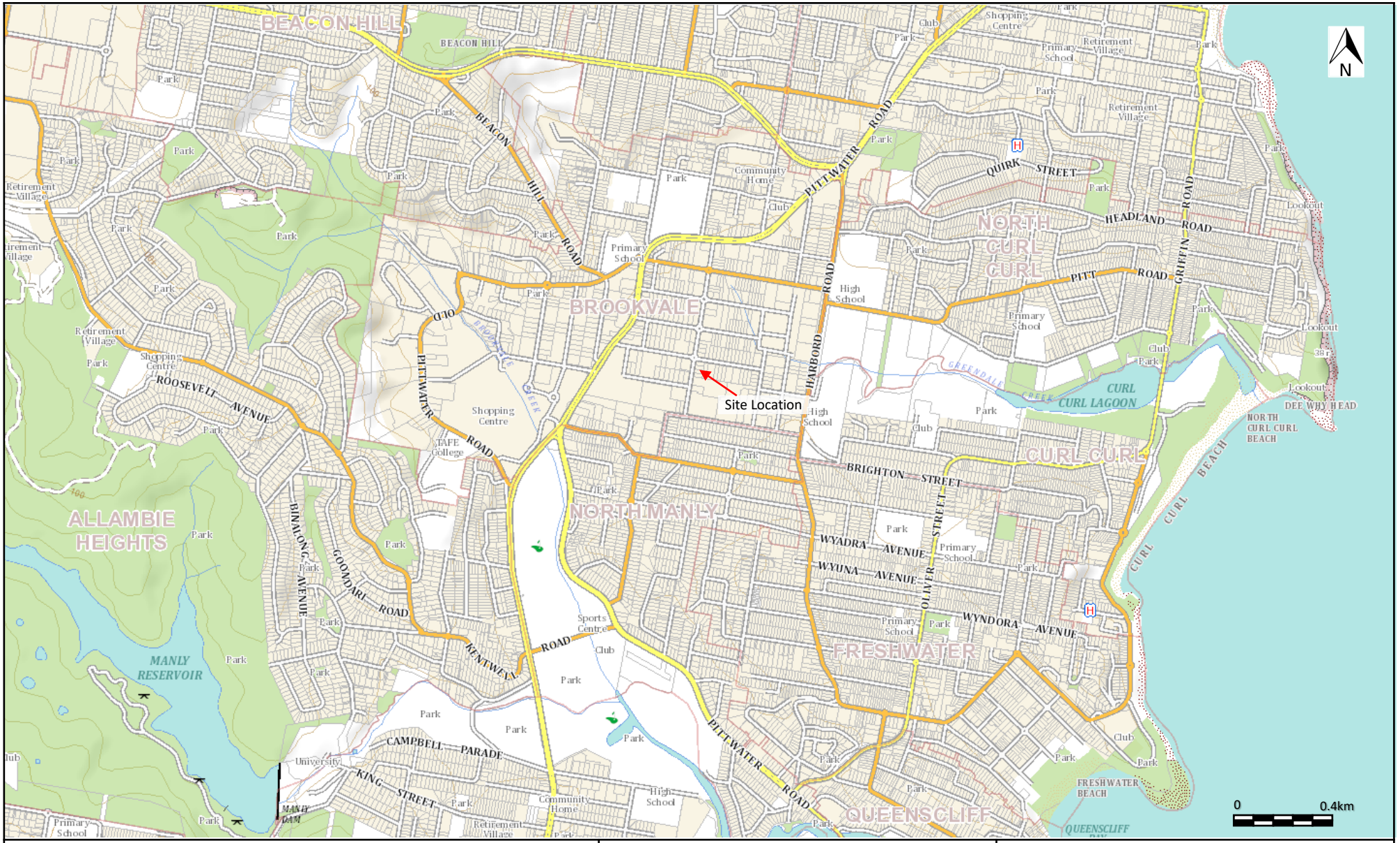
This report does not purport to give legal advice. This advice can only be given by qualified legal advisors.

To the extent permitted by law, Metech expressly disclaims and excludes liability for any loss, damage, cost or expenses suffered by any third party relating to or resulting from the use of, or reliance on, any information contained in this report. Metech does not admit that any action, liability or claim may exist or be available to any third party.

13.1 User Reliance

This report has been prepared exclusively for Dad & Dave's Brewery Pty Ltd and may not be relied upon by any other person or entity without Metech's express written permission.

Figures



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Project number:	EP147-RP02
Source:	SIX Maps, 2020
Revision:	1.0
Date:	13 August 2020

TITLE:	Figure 1 – Site Location
PROJECT:	Detailed Site Investigation 45 Mitchell Road, Brookvale, NSW
CLIENT:	Dad & Dave's Brewing Pty Ltd

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Project number:	EP147-RP02
Source:	SIX Maps, Chatswood 17/08/2018
Revision:	1.0
Date:	13 August 2020

TITLE:	Figure 2 – Site Layout
PROJECT:	Detailed Site Investigation 45 Mitchell Road, Brookvale, NSW
CLIENT:	Dad & Dave's Brewing Pty Ltd

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Project number:	EP147-RP02
Source:	SIX Maps, Chatswood 17/08/2018
Revision:	1.0
Date:	13 August 2020

TITLE:	Figure 3 – Areas of Environmental Concern
PROJECT:	Detailed Site Investigation 45 Mitchell Road, Brookvale, NSW
CLIENT:	Dad & Dave's Brewing Pty Ltd

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Project number:	EP147-RP02
Source:	SIX Maps, Chatswood 17/08/2018
Revision:	1.0
Date:	13 August 2020

TITLE:	Figure 4 – Sampling Locations
PROJECT:	Detailed Site Investigation 45 Mitchell Road, Brookvale, NSW
CLIENT:	Dad & Dave's Brewing Pty Ltd

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Project number:	EP147-RP02
Source:	SIX Maps, Chatswood 17/08/2018
Revision:	1.0
Date:	19 August 2020

TITLE:	Figure 5 – Investigation Criteria Exceedances
PROJECT:	Detailed Site Investigation 45 Mitchell Road, Brookvale, NSW
CLIENT:	Dad & Dave's Brewing Pty Ltd

Appendix A
SafeWork NSW Information

NSW GOVERNMENT | SafeWork NSW

Locked Bag 2906, Lisarow NSW 2252
Customer Experience 13 10 50
ABN 81 913 830 179 | www.safework.nsw.gov.au

Our Ref: D20/166460

14 August 2020

Ms Michelle
Metech Consulting Pty Ltd
mbattam@metech.consulting

Dear Michelle

RE SITE: 45 Mitchell Rd, Brookvale NSW 2100

I refer to your site search request received by SafeWork NSW 28 July 2020 requesting information on Storage of Hazardous Chemicals for the above site.

Enclosed are copies of the documents that SafeWork NSW holds on record number 35/012164 relating to the storage of Hazardous Chemicals at the above-mentioned premises.

For further information or if you have any questions, please call us on 13 10 50 or email licensing@safework.nsw.gov.au

Yours sincerely

Customer Service Officer
Customer Experience - Operations
SafeWork NSW

EFTPOS FROM WESTPAC
SAFEWORK NSW
92 TO 100 DONNISON STRE
GOSFORD 2250
Australia

TIME 14AUG20 13:51
MID 25234691
TSP 100381916693
RRN 200814055991
Mastercard(M) CR
CARD.....9861
AUTH 024695

MOTO AUD310.86

(000) APPROVED

CUSTOMER COPY

SAFEWORK NSW
92 DONNISON STREET
GOSFORD NSW 2250

14/08/20 14:12
000030#7613 0008
MARK

OTHER* $300.50
OTHER* $1.36
INV TTL $310.86
GST $28.26

CR CARD
$310.86

* indicates taxable
TAX INVOICE
81 913 830 179

INSPECTION RECORD

Licence No. 12164

Licensee: Sydney Meat Supply

Address: 45 Mitchell Road Brookvale

Storage licensed: 1 x 11900 Ltr U.G M.S

Sketch of Premises (Dimensions of depot and distance of same from adjoining "protected works" to be shown).

I have this date inspected the above premises and hereby certify that the depot detailed on the most recent licence form (DG1) dated ..... 11/3/86 ..... agree with the all licensable dangerous goods depots located on the premises.

..... Inspector of Dangerous Goods

..... Date

Inspected	Initials	Requisitions made or state of depot
3/86		Ad

M 5388 . Government Printer

New South Wales Government

Dangerous Goods Branch

1 Oxford Street
Sydney
P.O. Box 846
Darlinghurst, N.S.W. 2010

Our reference: 2164.

Your reference:

Telephone: 2388

Sydney Meat Supply Pty Ltd
45 Mitchell Rd
Brookvale.

31.

one.

M Conroy.
4.3.81

R/S.15/4/81
on. Order. 30.4.81
R/S.1/6/81
R/S.1/7/81
O.K. 5.8.81

APPLICATION FOR: REGISTRATION OF PREMISES / STORE LICENCE / AMENDMENT TO REGISTRATION OR LICENCE — FOR THE KEEPING OF INFLAMMABLE LIQUID AND/OR DANGEROUS GOODS 5

Name of Occupier Sydney Meat Supply Pty. Ltd.
(Surname) (First Names)

Trading Name (if any) Sydney Meat Supply Pty. Ltd.

Postal Address Box 53 Brookvale Postcode 2100

Address of the premises in which the depot or depots are situated 45 Mitchell Rd. Brookvale Postcode 2100

Occupation

Nature of Premises Wholesale Meat

Particulars of construction of depots and maximum quantities of inflammable liquid and/or dangerous goods to be kept at any one time.

~~PLEASE SKETCH SITE ON BACK OR ATTACH PLAN~~

Depot No.	Construction of depots *			Inflammable Liquid		Dangerous Goods						
	Walls	Roof	Floor	Mineral spirit litres	Mineral oil litres	Class 1 litres	Class 2 litres	Class 3 kg	Class 4 m^3	Class 5A# litres	Class 5B# litres	Class 9 litres
1	Underground Tank			11900								
2												
3												
4												
5												
6												
7												
8												
9												
10												
TOTAL												

PUBLIC ... 12.00 28/3/77 No. 8360

* If kept in tanks describe depots as underground or aboveground tanks.

\# Insert water capacity of tanks or cylinders.

Name of Company supplying inflammable liquid H. C. S.

Have premises previously been licensed? No

If known, state name of previous occupier N/A

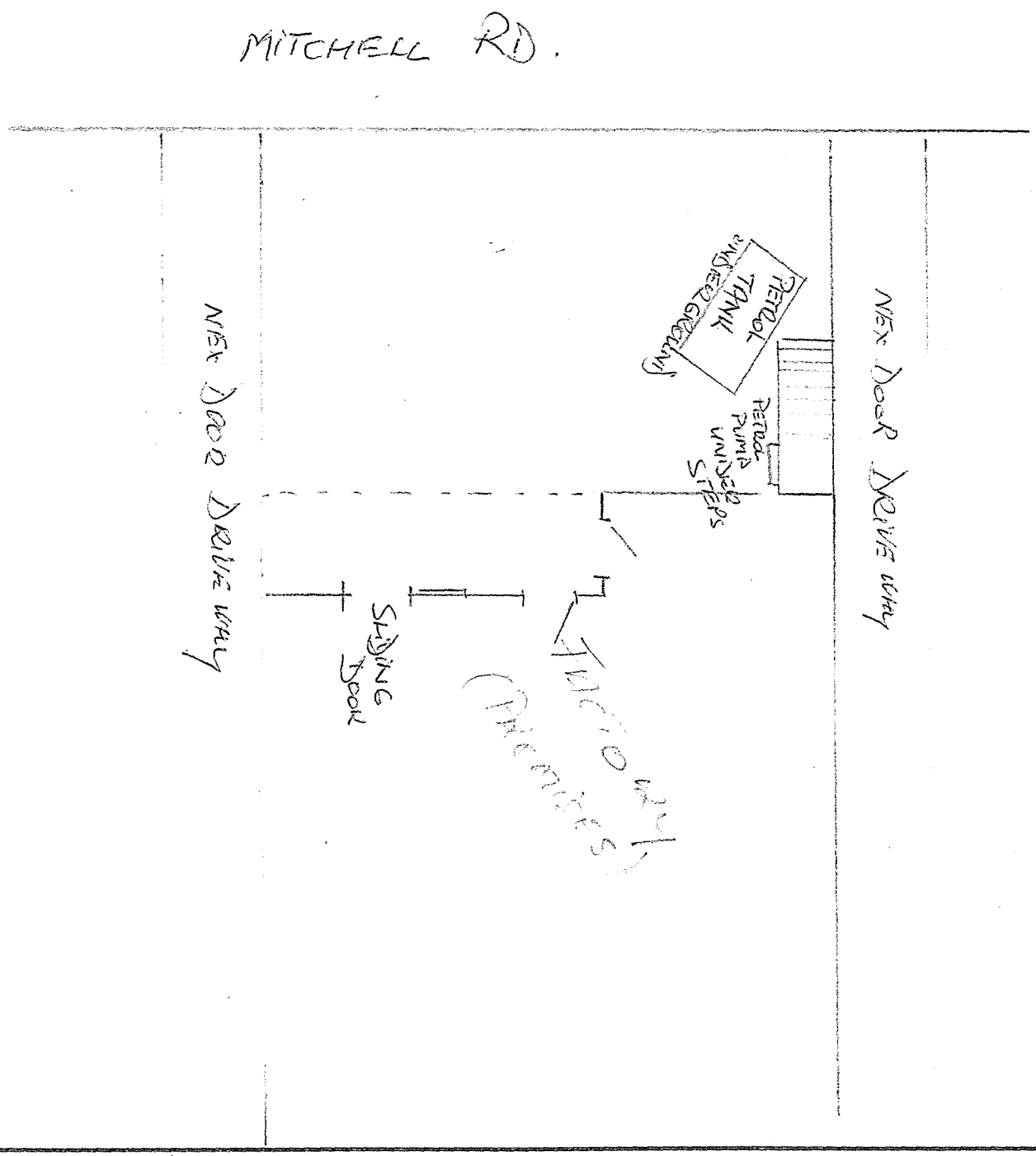
Signature of applicant [signature] Date 24-3-77

CERTIFICATE OF INSPECTION

I, [signature] E. Brooks being an Inspector under the Inflammable Liquid Act, 1915, do hereby certify that the premises or store described above does comply with the requirements of that Act and regulations with regard to its situation and construction for the keeping of inflammable liquid and/or dangerous goods in quantity and nature specified.

Signature of Inspector [signature]

Date 24-3-77



EXPLANATORY NOTES

NAME IN FULL OF OCCUPIER/S – Full name(s) of occupier(s) must be given. Trading name (if any) should also be shown.

NATURE OF PREMISES – State whether premises comprise of dwelling, service station, depot, etc.

CONSTRUCTION OF DEPOT – If storage is in an aboveground depot indicate the material of which the depot is constructed, e.g., brick, steel, concrete, and then the amount of inflammable liquid or dangerous goods and the type being stored, e.g., mineral spirit, kerosene, acetone, etc.

If storage is within underground or aboveground tanks, indicate the quantities and type of liquid or goods being stored in each tank. Also the capacity of each individual tank. Attach separate list, if space insufficient.

GENERAL DETAILS

Distance from Pump Block to Tank/s 2 M Distance from Tank/s to Fill Point/s Direct Fill

(Explosives Regulations provide that the Fill Point cannot be inside a building or within 5 feet of a doorway or window.)

Distance from Tank/s to Nearest Wall 2.5 Height of Wall 20'

Will Tank/s be inside Building? NO If so, under what surface (wood, concrete, etc.)? —

If Tank/s to be outside building describe present surface (Earth, Concrete, gravel, etc.) All Fill

Excavation for Tank/s — Describe type of soil (sand, clay, rock, etc.) Clay & Sand

If local labour available for excavations (Country Only) state contractor's name and address —

LOCAL COUNCIL REQUIREMENTS

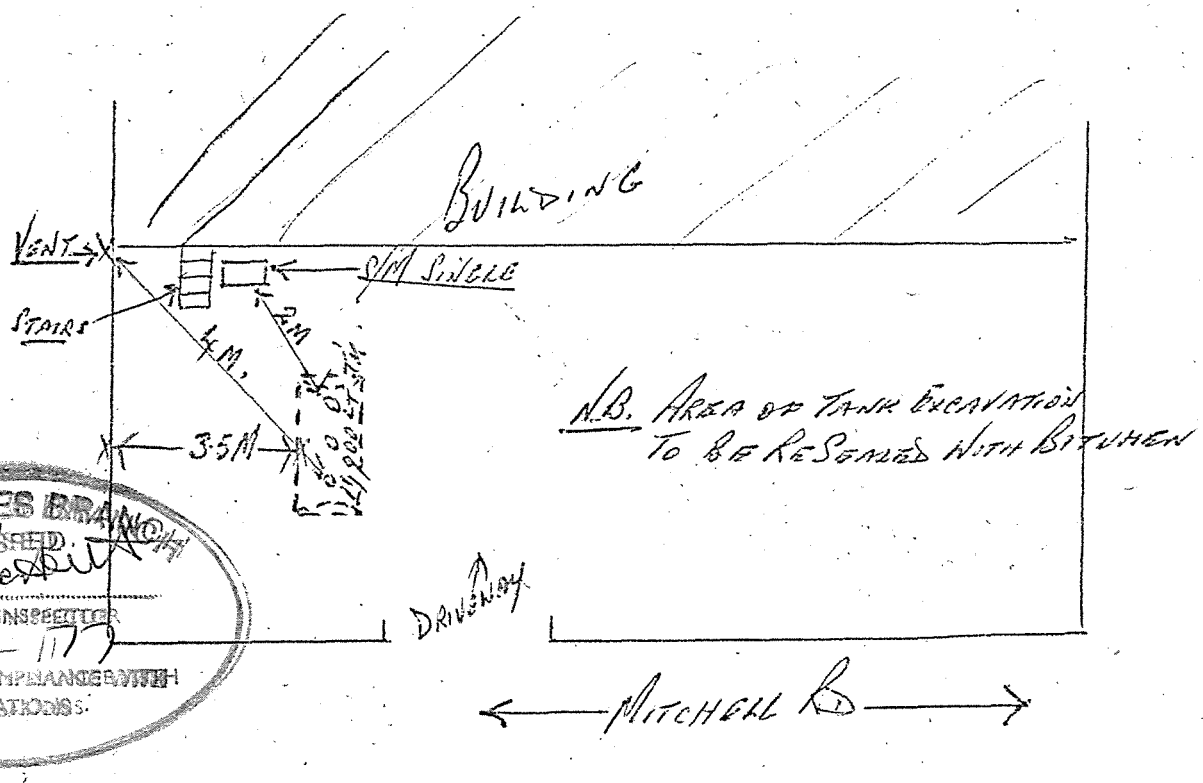
Name of Municipality WARRNAMBOOL

Has Council Permit been obtained? PENDING Approved - Tex J. Blackburn

Are there any special council requirements?

Prepare below Sketch Plan of Driveway Area showing details of Pump, Tank and Fill Point including location of other Company Pumps in relation to the Building. Frontages of property, distance between pumps, width of driveways, etc., to be included.

Show Single Pumps ☐ Dual Pumps ☐☐



EXPLOSIVES BRANCH
APPROVED
for CHIEF INSPECTOR
14/12/1979
SUBJECT TO COMPLIANCE WITH REGULATIONS

District Supervisor G Blackwood

GOLDEN FLEECE PETROLEUM

A division of H. C. Sleigh Limited: incorporated in Victoria

N.S.W. BRANCH

GOLDEN FLEECE HOUSE
100 PACIFIC HIGHWAY, NORTH SYDNEY 2060

P.O. BOX 915 NORTH SYDNEY 2060
TELEGRAMS GOLDENPET SYDNEY
TELEX 25652
TELEPHONE 929 0755

10/2/1977

The Superintendent
Explosives Department
P.O. Box R 216
ROYAL EXCHANGE
SYDNEY 2000

Dear Sir,

This Company is desirous of installing:-

1 x T.I.O. underground tank for Super Motor Spirit

..... underground tank for .....

..... underground tank for .....

At Sydney Meat Supply
45 Mitchell Rd.,
Brookvale

Attached hereto are two copies of sketch plans for your consideration and approval.

Yours faithfully
GOLDEN FLEECE PETROLEUM

OPERATIONS DEPARTMENT

Appendix B
Borehole Logs

Metech CONSULTING

BOREHOLE No: **MW1**

Sheet 1 of 1

Client:	Dad & Dave's Brewing Pty Ltd		
Project:	EP147 - Detailed Site Investigation		
Location:	45 Mitchell Road, Brookvale NSW	Supervised by:	Melissa Moyce
Date Investigated:	6/08/2020	Log checked by:	Michelle Battam
Driller:	Epoca Environmental		
Excavation Method:	Geoprobe		
Surface RL (Datum):			

Well Construction	Method	Sample Type	Graphic Log	Sample ID	Depth (m)	Material Description / Soil Classification	Consistency / Density (VS/Fb, S/VL, F/L, St/M, VSt/D, H/VD)	Moisture (D, M, W, S)	Headspace ppm	Structure and additional observations
					0.0	FILL: Medium-grained silty sand. Dark yellow/brown. Dry, with gravel.				Paved surface - concrete 190mm.
					0.4	FILL: Medium-grained silty sand with gravels. Light to dark grey. Moist.				
	HA	HA		MW1/0.6					0.6	
					0.8	SANDY CLAY: Light to medium sandy clay. Dark grey. Moist, low plasticity with medium-grained sand.				
		HA		MW1/1.0		CLAYEY SAND: Light clayey sand. Light grey/light brown, wet. Medium-grained sand with moderate plasticity clay.			0.7	
	PT				1.2					
					1.6					
		PT		MW1/2.0	2.0				0.2	
					2.4					
		PT		MW1/2.7					0.3	
	SFA				2.8	Light clayey sand. Light to dark grey, wet.				
		G		MW1/3.5	3.2				0.7	
					3.6					
		G		MW1/4.0					0.5	
					4.0	Borehole terminated @ 4.0m. Target depth reached.				
					4.4					
					4.8					
					5.2					
					5.6					
					6.0					

Water

- ▼ Standing water level (SWL)
- ▽ Water inflow
- NFGWO No free groundwater observed

Drilling Method

SFA	Solid flight auger
HFA	Hollow flight auger
PT	Push tube
HA	Hand auger
AR	Rock hammer (air rotary)

Sampling Method

G	Grab
SP	Split spoon
PT	Push tube
HA	Hand auger
D	Disturbed

Consistency / Relative Density

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

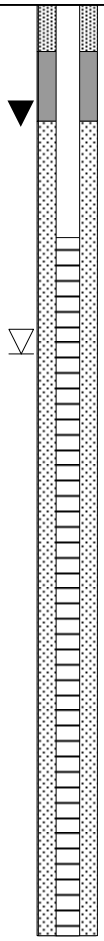
Moisture

D	dry
M	moist
W	wet
S	saturated

Metech CONSULTING

BOREHOLE No:
MW2
Sheet 1 of 1

Client: Dad & Dave's Brewing Pty Ltd
Project: EP147 - Detailed Site Investigation
Location: 45 Mitchell Road, Brookvale NSW
Date Investigated: 6/08/2020
Supervised by: Melissa Moyce
Log checked by: Michelle Battam
Driller: Epoca Environmental
Excavation Method: Geoprobe
Surface RL (Datum):



Method	Sample Type	Graphic Log	Sample ID	Depth (m)	Material Description / Soil Classification	Consistency / Density (VS/Fb, S/VL, F/L, St/M, VSt/D, H/VD)	Moisture (D, M, W, S)	Headspace ppm	Structure and additional observations
				0.0	CLAYEY SAND: Light to medium clayey sand. Light grey. Moist, low plasticity clay with medium-grained sand.				Paved surface - concrete 230mm.
HA				0.4					
					Light to medium clayey sand. Dark grey.				
	HA		MW2/1.0	0.8				1.3	
				1.2	SANDY CLAY: Light to medium sandy clay. Light grey.				
				1.6					
	PT		MW2/2.0	2.0				0.5	
				2.4					
PT					CLAYEY SAND: Light to medium clayey sand. Light grey. Wet, coarse-grained sand with low plasticity clay, minor sulfuric odour.				
	PT		MW2/3.0	2.8				1.0	
				3.2					
	PT		MW2/3.9	3.6	CLAY: Band of medium clay. Dark grey, moist.			0.5	
					CLAYEY SAND: Light to medium clayey sand. Light grey. Wet, coarse-grained sand with low plasticity clay, minor sulfuric odour.				
				4.0					
				4.4					
	PT		MW2/5.0	4.8				0.5	
					Borehole terminated @ 5.0m. Target depth reached.				
				5.2					
				5.6					
				6.0					

Water
- ▼ Standing water level (SWL)
- ▽ Water inflow
- NFGWO No free groundwater observed

Drilling Method

SFA	Solid flight auger
HFA	Hollow flight auger
PT	Push tube
HA	Hand auger
AR	Rock hammer (air rotary)

Sampling Method

G	Grab
SP	Split spoon
PT	Push tube
HA	Hand auger
D	Disturbed

Consistency / Relative Density

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

Moisture

D	dry
M	moist
W	wet
S	saturated

Metech CONSULTING

BOREHOLE No:
BH1
Sheet 1 of 1

Client: Dad & Dave's Brewing Pty Ltd
Project: EP147 - Detailed Site Investigation
Location: 45 Mitchell Road, Brookvale NSW
Date Investigated: 6/08/2020

Supervised by: Melissa Moyce
Log checked by: Michelle Battam

Driller: Epoca Environmental
Excavation Method: Geoprobe
Surface RL (Datum):

Well Construction	Method	Sample Type	Graphic Log	Sample ID	Depth (m)	Material Description / Soil Classification	Consistency / Density (VS / Fb, S / VL, F / L, St / M, VSt / D, H / VD)	Moisture (D, M, W, S)	Headspace ppm	Structure and additional observations
	HA				0.0	FILL: Light to medium sandy clay. Dark grey. Moist, moderate plasticity, with medium-grained sand and gravel.				Paved surface - concrete 160mm.
					0.4					
					0.6	Borehole terminated @ 0.6m. Refusal on brick structure (drain).				
					0.8					
					1.2					
					1.6					
					2.0					
					2.4					
					2.8					
					3.2					
					3.6					
					4.0					
					4.4					
					4.8					
					5.2					
					5.6					
					6.0					

Water

- ▼ Standing water level (SWL)
- ▽ Water inflow
- NFGWO No free groundwater observed

Drilling Method

SFA	Solid flight auger
HFA	Hollow flight auger
PT	Push tube
HA	Hand auger
AR	Rock hammer (air rotary)

Sampling Method

G	Grab
SP	Split spoon
PT	Push tube
HA	Hand auger
D	Disturbed

Consistency / Relative Density

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

Moisture

D	dry
M	moist
W	wet
S	saturated

Metech CONSULTING

BOREHOLE No:
BH1A

Sheet 1 of 1

Client: Dad & Dave's Brewing Pty Ltd
Project: EP147 - Detailed Site Investigation
Location: 45 Mitchell Road, Brookvale NSW
Date Investigated: 6/08/2020

Supervised by: Melissa Moyce
Log checked by: Michelle Battam

Driller: Epoca Environmental
Excavation Method: Geoprobe
Surface RL (Datum):

Well Construction	Method	Sample Type	Graphic Log	Sample ID	Depth (m)	Material Description / Soil Classification	Consistency / Density (VS/Fb, S/VL, F/L, St/M, VSt/D, H/VD)	Moisture (D, M, W, S)	Headspace ppm	Structure and additional observations
	HA	HA		BH1A/0.5	0.0 – 0.4	FILL: Light to medium sandy clay. Dark grey. Moist, moderate plasticity, with medium-grained sand and gravel.			0.5	Paved surface - concrete 160mm.
		HA		BH1A/1.0	0.4 – 0.8	SANDY CLAY: Light to medium sandy clay. Dark grey. Moist, low plasticity clay with medium-grained sand.			0.3	
	PT	HA		BH1A/2.0	0.8 – 1.6	CLAYEY SAND: Light clayey sand. Light grey, wet, minor sulfuric odour. Medium-grained sand with low plasticity clay			2.6	
		PT		BH1A/3.0	1.6 – 2.8				0.5	
		PT		BH1A/3.9	2.8 – 3.6	CLAY: Band of medium clay. Dark grey, moist.			0.2	
		PT		BH1A/4.5	3.6 – 4.8	CLAYEY SAND: Light clayey sand. Light grey, moist, coarse-grained sand.			0.5	
		PT		BH1A/5.4	4.8 – 5.2	SAND: Coarse-grained sand. Light grey, wet.			0.3	
					5.2 – 6.0	Borehole terminated @ 5.4m. Pushtube refusal in wet sand.				

Water

- ▼ Standing water level (SWL)
- ▽ Water inflow
- NFGWO No free groundwater observed

Drilling Method

SFA	Solid flight auger
HFA	Hollow flight auger
PT	Push tube
HA	Hand auger
AR	Rock hammer (air rotary)

Sampling Method

G	Grab
SP	Split spoon
PT	Push tube
HA	Hand auger
D	Disturbed

Consistency / Relative Density

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

Moisture

D	dry
M	moist
W	wet
S	saturated

Metech CONSULTING

BOREHOLE No:
BH2
Sheet 1 of 1

Client: Dad & Dave's Brewing Pty Ltd
Project: EP147 - Detailed Site Investigation
Location: 45 Mitchell Road, Brookvale NSW
Date Investigated: 6/08/2020

Supervised by: Melissa Moyce
Log checked by: Michelle Battam

Driller: Epoca Environmental
Excavation Method: Geoprobe
Surface RL (Datum):

Well Construction	Method	Sample Type	Graphic Log	Sample ID	Depth (m)	Material Description / Soil Classification	Consistency / Density (VS/Fb, S/VL, F/L, St/M, VSt/D, H/VD)	Moisture (D, M, W, S)	Headspace ppm	Structure and additional observations
	HA				0.0	FILL: Medium-grained silty sand. Dark yellow/brown. Dry, with gravel.				Paved surface - concrete 130mm.
	HA				0.4	FILL: Medium-grained silty sand. Light to dark grey. Moist, minor HC odour.				
	HA	HA		BH2/0.9	0.8	FILL: Medium-grained clayey sand with gravel. Dark grey/black. Moist, HC odour.			1021.0	
	PT				1.2					
	PT	PT		BH2/1.5					110.0	
	PT				1.6	FILL: Medium-grained clayey sand with gravel. Dark grey/black. Wet, HC odour.				
	PT	PT		BH2/1.9					112.0	
					2.0	Borehole terminated @ 1.9m. Refusal on concrete (inferred associated with former tankpit).				
					2.4					
					2.8					
					3.2					
					3.6					
					4.0					
					4.4					
					4.8					
					5.2					
					5.6					
					6.0					

Water

- ▼ Standing water level (SWL)
- ▽ Water inflow
- NFGWO No free groundwater observed

Drilling Method

SFA	Solid flight auger
HFA	Hollow flight auger
PT	Push tube
HA	Hand auger
AR	Rock hammer (air rotary)

Sampling Method

G	Grab
SP	Split spoon
PT	Push tube
HA	Hand auger
D	Disturbed

Consistency / Relative Density

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

Moisture

D	dry
M	moist
W	wet
S	saturated

Metech CONSULTING

BOREHOLE No:
BH2A

Sheet 1 of 1

Client: Dad & Dave's Brewing Pty Ltd
Project: EP147 - Detailed Site Investigation
Location: 45 Mitchell Road, Brookvale NSW
Date Investigated: 6/08/2020

Supervised by: Melissa Moyce
Log checked by: Michelle Battam

Driller: Epoca Environmental
Excavation Method: Geoprobe
Surface RL (Datum):

Well Construction	Method	Sample Type	Graphic Log	Sample ID	Depth (m)	Material Description / Soil Classification	Consistency / Density (VS/Fb, S/VL, F/L, St/M, VSt/D, H/VD)	Moisture (D, M, W, S)	Headspace ppm	Structure and additional observations
	HA				0.0	FILL: Medium-grained silty sand. Dark yellow/brown. Dry, with gravel.				Paved surface - concrete 160mm.
					0.4					
					0.8	SANDY CLAY: Light to medium sandy clay. Dark grey. Moist, low plasticity clay with medium-grained sand.				
					1.2					
	PT				1.6	CLAYEY SAND: Light clayey sand. Dark grey/brown, wet, HC odour. Medium-grained sand with low-plasticity clay.				
					2.0	Light clayey sand. Light grey/light brown, moist.				
		PT		BH2A/2.5	2.4				3.7	
					2.8	SANDY CLAY: Light to medium sandy clay. Dark grey/brown, moist, low plasticity clay with medium-grained sand. HC odour.				
		G		BH2A/3.0					36.0	
					3.2					
					3.6					
		G		BH2A/4.0					23.6	
	SFA				4.0	Light to medium sandy clay. Dark grey/brown, wet, no detectable odour.				
		G		BH2A/4.5	4.4				42.4	
					4.8					
					5.2					
		G		BH2A/5.5					11.3	
					5.6					
		G		BH2A/6.0					10.2	
					6.0	Borehole terminated @ 6.0m. Target				

Water

- ▼ Standing water level (SWL)
- ▽ Water inflow
- NFGWO No free groundwater observed

Drilling Method

SFA	Solid flight auger
HFA	Hollow flight auger
PT	Push tube
HA	Hand auger
AR	Rock hammer (air rotary)

Sampling Method

G	Grab
SP	Split spoon
PT	Push tube
HA	Hand auger
D	Disturbed

Consistency / Relative Density

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

Moisture

D	dry
M	moist
W	wet
S	saturated

Metech CONSULTING

BOREHOLE No:
BH3
Sheet 1 of 1

Client: Dad & Dave's Brewing Pty Ltd
Project: EP147 - Detailed Site Investigation
Location: 45 Mitchell Road, Brookvale NSW
Date Investigated: 6/08/2020

Supervised by: Melissa Moyce
Log checked by: Michelle Battam

Driller: Epoca Environmental
Excavation Method: Geoprobe
Surface RL (Datum):

Well Construction	Method	Sample Type	Graphic Log	Sample ID	Depth (m)	Material Description / Soil Classification	Consistency / Density (VS/Fb, S/VL, F/L, St/M, VSt/D, H/VD)	Moisture (D, M, W, S)	Headspace ppm	Structure and additional observations
	HA	HA		BH3/0.5	0.4	SANDY CLAY: Light to medium sandy clay. Dark grey. Moist, low plasticity clay with medium-grained sand.			0.2	Paved surface - concrete 380mm.
		HA		BH3/1.0	0.8				0.2	
					1.2	Borehole terminated @ 1.0m. Target depth reached.				
					1.6					
					2.0					
					2.4					
					2.8					
					3.2					
					3.6					
					4.0					
					4.4					
					4.8					
					5.2					
					5.6					
					6.0					

Water
- ▼ Standing water level (SWL)
- ▽ Water inflow
- NFGWO No free groundwater observed

Drilling Method

SFA	Solid flight auger
HFA	Hollow flight auger
PT	Push tube
HA	Hand auger
AR	Rock hammer (air rotary)

Sampling Method

G	Grab
SP	Split spoon
PT	Push tube
HA	Hand auger
D	Disturbed

Consistency / Relative Density

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

Moisture

D	dry
M	moist
W	wet
S	saturated

Appendix C
Field Records

PID Calibration Certificate

Instrument **PhoCheck Tiger**
Serial No. **T-111092**

airmet

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments			
Battery	Charge Condition	✓				
	Fuses	✓				
	Capacity	✓				
	Recharge OK?	✓				
Switch/keypad	Operation	✓				
Display	Intensity	✓				
	Operation (segments)	✓				
Grill Filter	Condition	✓				
	Seal	✓				
Pump	Operation	✓				
	Filter	✓				
	Flow	✓				
	Valves, Diaphragm	✓				
PCB	Condition	✓				
Connectors	Condition	✓				
Sensor	PID	✓	10.6 ev			
Alarms	Beeper	✓	**Low**	**High**	**TWA**	**STEL**
	Settings	✓	50ppm	100ppm		
Software	Version	✓				
Data logger	Operation	✓				
Download	Operation	✓				
Other tests:						

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Diffusion mode Aspirated mode

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No		Instrument Reading
PID Lamp		92 ppm isobutylene		SY245		91.3ppm

Calibrated by: **Lesley Nearn-Cavanagh**

Calibration date: **4/08/2020**

Next calibration due: **31/01/2021**

Groundwater Monitoring Field Sheet

Project Information			
Project Number:	EP147	Well ID:	MW1
Project Name:	BROOKVALE (MITCHELL RD)		
Date:	11/8/20	Time Start: 11:08	Time Finish: 12:13

Equipment				
Water Quality Monitor:	YSI Professional Plus	Daily Calibration:	(Yes) / No	
Interface Probe:	Geotech	Calibration Certificate:	(Yes) / No	
Purging Equipment	Bailer Type:	Teflon	Plastic	(Stainless Steel)
	Pump Type:	Peristaltic	Micro-purge	(Submersible)

Well Gauging and Purge Volume Calculations								
Casing Diameter:	25mm	(50mm)	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (L/m):	0.98	(1.96)	7.75	31.4	49.1	70.7	125.7	196.3

Total Well Depth (-) Water Level (=) Water Column

3.875 m (-) 0.403 m (=) 3.47 m

Water Column (x) Conversion Factor (=) Litres per 1 Well Volume

3.47 m (x) 1.96 m (=) 6.8012 L

Groundwater Gauging			
Initial Well Depth (mTOC):	~~0.505~~ 3.875	Initial SWL (mTOC):	0.403
Purge Draw-down – InitialSWL (mTOC):		Purge Draw-down – Stabilised SWL (mTOC):	~~1.47~~ 1.41 1.19

Water Quality Parameters

Litres	Time	pH	Temp (°C)	Cond (uS/cm)	DO (ppm)	Redox (mV)	Comments
10	11:08	6.50	18.2	313.3	4.36	99.4	grey silty, no odour, no sheen
20	11:23	6.36	18.3	260.2	~~4.18~~ 4.13	188.1	grey silty
25	11:33	6.37	18.5	259.4	2.35	112.4	w e
30	11:45	6.21	18.5	259.7	2.62	122.2	u s
35	11:50	6.20	18.5	69.3	2.72	119.3	M 4
40	11:55	6.57	18.3	76.7	4.47	89.3	Sulfuric odour
45	12:03	5.86	18.5	91.9	5.71	99.3	
Stabilisation Criteria		+/- 0.05	+/- 10%	+/- 3%	+/- 10%	+/- 10%	

	Total Purge Volume: 43L	Did Field Parameters Stabilise:	(Yes) / No
		Was the Well Purged Dry:	Yes / (No)

Groundwater Sample Details			
Sample ID:	MW1	No. Containers:	8
Control:	QC Sample: (Yes) / No	QC ID:	QA3

Groundwater Monitoring Field Sheet

Project Information			
Project Number:	EP147	Well ID:	MW2
Project Name:	BROOKVALE (MITCHELL RD)		
Date:	11/8/20	Time Start: 12:35	Time Finish: 12:58

Equipment				
Water Quality Monitor:	YSI Professional Plus	Daily Calibration:	(Yes) / No	
Interface Probe:	Geotech	Calibration Certificate:	(Yes) / No	
Purging Equipment	Bailer Type:	Teflon	Plastic	(Stainless Steel)
	Pump Type:	Peristaltic	Micro-purge	(Submersible)

Well Gauging and Purge Volume Calculations								
Casing Diameter:	25mm	(50mm)	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (L/m):	0.98	(1.96)	7.75	31.4	49.1	70.7	125.7	196.3

Total Well Depth (-) Water Level (=) Water Column

4.20 m (-) 0.524 m (=) 3.676 m

Water Column (x) Conversion Factor (=) Litres per 1 Well Volume

3.676 m (x) 1.96 m (=) 7.20 L

Groundwater Gauging			
Initial Well Depth (mTOC):	4.20	Initial SWL (mTOC):	~~0.525~~ 0.524
Purge Draw-down – InitialSWL (mTOC):		Purge Draw-down – Stabilised SWL (mTOC):	0.595

Water Quality Parameters

Litres	Time	pH	Temp (°C)	Cond (uS/cm)	DO (ppm)	Redox (mV)	Comments
10	12:35	8.04	18.4	64.9	11.44	122	silty grey, sulfurate odor
20	12:39	6.33	18.7	39.1	8.30	-12.7	
30	12:43	5.88	18.5	43.6	7.87	-26.3	
35	12:46	5.74	19.0	14.3	6.07	-44.8	
40	12:50	5.45	18.9	193.4	6.05	-74.4	
45	12:54	5.35	18.7	185.0	6.97	-57.3	
50	12:58	5.23	18.9	186.1	3.49	-59.1	
Stabilisation Criteria		+/- 0.05	+/- 10%	+/- 3%	+/- 10%	+/- 10%	

	Total Purge Volume: 50L	Did Field Parameters Stabilise:	(Yes) / No
		Was the Well Purged Dry:	Yes / (No)

Groundwater Sample Details			
Sample ID:	MW2	No. Containers:	4
Quality Control:	QC Sample: Yes / (No)	QC ID:	—

Multi Parameter Water Meter -

Instrument YSI Quatro Pro Plus
Serial No. 14D101796

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 10.00		pH 10.00		352607	pH 9.60
2. pH 7.00		pH 7.00		330737	pH 7.07
3. pH 4.00		pH 4.00		330734	pH 4.12
4. mV		231.8mV		346052/342074	231.6mV
5. EC		2.76mS		343511	2.74mS
6. D.O		0.00ppm		1904288592	0.00ppm
7. Temp		21.0°C		MultiTherm	21.0°C

Calibrated by: Eloise Carroll

Calibration date: 10/08/2020

Next calibration due: 6/02/2021

Appendix D
Analytical Result Summary Tables

Table 1
Detailed Site Investigation - 45 Mitchell Road Brookvale
Sample Register

Sample ID	Date Sampled	Sample Interval	Sampled By	Sample Type	QC Sample	PID	Analytes Tested [1]
Soil Investigation							
MW1/0.6	6/08/2020	0.4	MM	Soil	-	0.6	TRH, BTEXN, PAH, Heavy Metals
MW1/1.0	6/08/2020	0.8	MM	Soil	-	0.7	Hold
MW1/2.0	6/08/2020	1.8	MM	Soil	QA1	0.2	TRH, BTEXN, PAH
MW1/2.7	6/08/2020	2.5	MM	Soil	-	0.3	Hold
MW1/3.5	6/08/2020	3.3	MM	Soil	-	0.7	Hold
MW1/4.0	6/08/2020	3.8	MM	Soil	-	0.5	Hold
MW2/1.0	6/08/2020	0.8	MM	Soil	-	1.3	TRH, BTEXN, PAH, Heavy Metals
MW2/2.0	6/08/2020	1.8	MM	Soil	-	0.5	Hold
MW2/3.0	6/08/2020	2.8	MM	Soil	-	1.0	TRH, BTEXN, PAH
MW2/3.9	6/08/2020	3.5	MM	Soil	-	0.5	Hold
MW2/5.0	6/08/2020	4.8	MM	Soil	-	0.5	Hold
BH1A/0.5	6/08/2020	0.3	MM	Soil	-	0.5	OCP, OPP
BH1A/1.0	6/08/2020	0.8	MM	Soil	-	0.3	TRH, BTEXN, PAH, Heavy Metals
BH1A/2.0	6/08/2020	1.8	MM	Soil	-	2.6	Hold
BH1A/3.0	6/08/2020	2.8	MM	Soil	-	0.5	TRH, BTEXN, PAH
BH1A/3.9	6/08/2020	3.7	MM	Soil	-	0.2	Hold
BH1A/4.5	6/08/2020	4.3	MM	Soil	-	0.5	Hold
BH1A/5.4	6/08/2020	5.2	MM	Soil	-	0.3	Hold
BH2/0.9	6/08/2020	0.7	MM	Soil	-	1021	TRH, BTEXN, PAH, Heavy Metals
BH2/1.5	6/08/2020	1.3	MM	Soil	-	110	Hold
BH2/1.9	6/08/2020	1.7	MM	Soil	-	112	Hold
BH2A/2.5	6/08/2020	2.3	MM	Soil	QA2	3.7	Hold
BH2A/3.0	6/08/2020	2.8	MM	Soil	-	36.0	TRH, BTEXN, PAH
BH2A/4.0	6/08/2020	3.8	MM	Soil	-	23.6	Hold
BH2A/4.5	6/08/2020	4.3	MM	Soil	-	42.4	Hold
BH2A/5.5	6/08/2020	5.3	MM	Soil	-	11.3	Hold
BH2A/6.0	6/08/2020	5.8	MM	Soil	-	10.2	Hold
BH3/0.5	7/08/2020	0.3	MM	Soil	-	0.2	TRH, BTEXN, PAH, Heavy Metals, OCP, OPP
BH3/1.0	7/08/2020	0.8	MM	Soil	-	0.2	Hold
Groundwater Investigation							
MW1	11/08/2020	-	MM	Water	QA3	-	TRH, BTEXN, PAH, Heavy Metals
MW2	11/08/2020	-	MM	Water	-	-	TRH, BTEXN, PAH, Heavy Metals
QA/QC							
QA1	6/08/2020	-	MM	Soil	Duplicate of MW1/2.0	-	TRH, BTEXN, PAH
QA2	6/08/2020	-	MM	Soil	Duplicate of BH2A/2.5	-	Hold
QA3	11/08/2020	-	MM	Water	Duplicate of MW1	-	TRH, BTEXN, PAH, Heavy Metals

Notes:

Heavy Metals = As, Cd, Cr, Cu, Pb, Hg, Ni and Zn
TRH = Total Recoverable Hydrocarbons
BTEXN = Benzene, Toluene, Ethylbenzene, Xylenes, Napthalene
PAH = Polycyclic Aromatic Hydrocarbons
OCP = Organochlorine Pesticides
OPP = Organophosporus Pesticides

Table 2
Detailed Site Investigation - 45 Mitchell Road Brookvale
Soil Analytical Results - Heavy Metals

All units in mg/kg (except where indicated)

Sample ID	Depth	Sampling Date	Metals							
			Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Copper (Cu)	Lead (Pb)	Mercury (Hg)	Nickel (Ni)	Zinc (Zn)
PQL			4.0	0.4	1.0	1.0	1.0	0.10	1.0	1.0
Environmental Investigation Levels[1]			160 [5]	3 [7]	310 [8]	140 [6]	1,800 [5]	1 [7]	55 [9]	110 [10]
Health Investigation Levels[2]			3000	900	3600 [4]	240,000	1,500	180 [3]	6,000	400,000
MW1/0.6	0.6	6/08/2020	2.8	nd	25	nd	35	0.1	5.3	8.9
MW2/1.0	1	6/08/2020	7.9	nd	17	8.3	61	0.3	nd	89
BH1A/1	1	6/08/2020	3.4	nd	16	17	58	0.2	nd	**160**
BH2/0.9	0.9	6/08/2020	nd	nd	7.9	5.3	15	nd	11	22
BH3/0.5	0.5	6/08/2020	nd	nd	14	nd	15	nd	nd	12

[1] Environmental Investigation Levels (EILs) - NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999. Commercial and industrial setting

[2] Health Investigation Levels (HILs) - NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999 HIL D: Commercial/industrial, includes premises such as shops, offices, factories and industrial sites.

[3] Based on inorganic mercury.

[4] Due to the absence of criteria for Cr (Total), Cr(VI) criteria has been adopted for initial screening purposes.

[5] Generic EIL adopted for Aged Contaminants (NEPC 2013).

[6] CEC data not available to calculate site-specific criteria for Cu based on NEPC (2013) requirements. Conservatively, the ACL for soils with a CEC of 5 $cmol_c/kg$ has been adopted (commercial and industrial setting).

[7] Due to absence of criteria in NEPC (2013), the provisional phytotoxicity-based investigation levels (NSW DEC 2006) have been adopted for initial screening purposes.

[8] Clay content data not available to calculate site-specific criteria for Cr(III) based on NEPC (2013) requirements. Conservatively, the ACL for soils with 1% clay content has been adopted (commercial and industrial).

[9] CEC data not available to calculate site-specific criteria for Ni based on NEPC (2013) requirements. Conservatively, the ACL for soils with a CEC of 5 $cmol_c/kg$ has been adopted (commercial and industrial).

[10] CEC data not available to calculate site-specific criteria for Zn based on NEPC (2013) requirements. Conservatively, the ACL for soils with a CEC of 5 $cmol_c/kg$ and a pH of 4.0 has been adopted (commercial and industrial).

BOLD Above ESL

Above HIL

PQL: Practical Quantification Limit
nd: Concentration below PQL
- : Not applicable

Table 3
Detailed Site Investigation - 45 Mitchell Road Brookvale
Soil Analytical Results - Volatile Total Recoverable Hydrocarbons

All units in mg/kg

Z:\METECH CONSULTING\EP - Projects\EP147 - Brookvale (Mitchell Rd)\08 Report\EP147_RP02 - DSI\Results Tables\[EP147_RP01 - Appendix D - Result Tables.xlsx]3. Soil-vTRH

Sample ID	Depth	Sampling Date	Volatile Total Recoverable Hydrocarbons (vTRH/BTEXN)								
			C_6-C_9	C_6-C_{10}	F1 (C6-C10 less BTEX)	Benzene	Toluene	Ethylbenzene	m+p-Xylene	o-Xylene	Naphthalene
PQL			**25**	**25**	**25**	**0.2**	**0.5**	**1**	**2**	**1**	**1**
Environmental Screening Levels[1]			**-**	**-**	**215**	**75**	**135**	**165**	**180**		**370 [2]**
Health Screening Levels - Vapour Intrusion (0 - <1m)[3]			**-**	**-**	**260**	**3**	**-**	**-**	**230**		**-**
Health Screening Levels - Vapour Intrusion (1 - <2m)[3]			**-**	**-**	**370**	**3**	**-**	**-**	**-**		**-**
Health Screening Levels - Management Limits[4]			**-**	**-**	**700**	**-**	**-**	**-**	**-**		**-**
MW1/0.6	0.6	6/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW1/2.0	0.2	6/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW2/1.0	1	6/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW2/3.0	3	6/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd
BH1A/1	1	6/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd
BH1A/3	3	6/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd
BH2/0.9	0.9	6/08/2020	380	110	**450**	0.5	nd	0.5	0.4	0.1	14
BH2A/3.0	3	6/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd
BH3/0.5	0.5	6/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd
QA1	-	6/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd

[1] Environmental Screening Levels (ESLs) - NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999.
Commercial and industrial setting
Owing to the presence of sand, the 'COARSE' soil type assessment criteria have been adopted.
[2] Environmental Investigation Levels (EILs) - NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999.
Commercial and industrial setting
[3] Health Screening Levels (HSLs) for Vapour Intrusion - NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999.
Commercial / industrial land use setting, 'SAND' criteria has been adopted based on site geological conditions.
[4] Health Screening Levels (HSLs), Management Limits for TPH Fractions - NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999
'COARSE' soil texture criteria adopted.

PQL: Practical Quantification Limit
nd: Concentration below PQL
- : Not applicable

BOLD Above ESL
Above HSL (Vapour Intrusion)
Above HSL (Management Limits)

Table 4
Detailed Site Investigation - 45 Mitchell Road Brookvale
Soil Analytical Results - Semi-Volatile Total Recoverable Hydrocarbons

All units in mg/kg

Z:\METECH CONSULTING\EP - Projects\EP147 - Brookvale (Mitchell Rd)\08 Report\EP147_RP02 - DSI\Results Tables\[EP147_RP01 - Appendix D - Result Tables.xlsx]4. Soil-svTRH

Sample ID	Depth	Sampling Date	Semi-Volatile Total Recoverable Hydrocarbons (svTRH/BTEXN)						
			C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	>C_{10}-C_{16}	F2 >C10-C16 less Naphthalene	F3 >C_{16}-C_{34}	F4 >C_{34}-C_{40}
PQL			**50**	**100**	**100**	**50**	**50**	**100**	**100**
Environmental Screening Levels[1]			**-**	**-**	**-**	**170**	**170**	**1,700**	**3,300**
Health Screening Levels - Vapour Intrusion (0 - <1m)[2]			**-**	**-**	**-**	**-**	**-**	**-**	**-**
Health Screening Levels - Vapour Intrusion (1 - <2m)[2]			**-**	**-**	**-**	**-**	**-**	**-**	**-**
Health Screening Levels - Vapour Intrusion (2 - <4m)[2]			**-**	**-**	**-**	**-**	**-**	**-**	**-**
Health Screening Levels - Management Limits[3]			**-**	**-**	**-**	**1,000**	**1,000**	**3,500**	**10,000**
MW1/0.6	0.6	6/08/2020	nd	nd	nd	nd	nd	nd	nd
MW1/2.0	0.2	6/08/2020	nd	nd	nd	nd	nd	nd	nd
MW2/1.0	1	6/08/2020	nd	nd	nd	nd	nd	nd	nd
MW2/3.0	3	6/08/2020	nd	nd	nd	nd	nd	nd	nd
BH1A/1	1	6/08/2020	nd	nd	nd	nd	nd	nd	nd
BH1A/3	3	6/08/2020	nd	nd	nd	nd	nd	nd	nd
BH2/0.9	0.9	6/08/2020	110	nd	nd	130	116	nd	nd
BH2A/3.0	3	6/08/2020	nd	nd	nd	nd	nd	nd	nd
BH3/0.5	0.5	6/08/2020	nd	nd	nd	nd	nd	nd	nd
QA1	-	6/08/2020	nd	nd	nd	nd	nd	nd	nd

[1] Environmental Screening Levels (ESLs) - NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999.
Commercial and industrial setting
Owing to the presence of sand, the 'COARSE' soil type assessment criteria have been adopted.
[2] Health Screening Levels (HSLs) for Vapour Intrusion - NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999.
Commercial / industrial land use setting, 'SAND' criteria has been adopted based on site geological conditions.
[3] Health Screening Levels (HSLs), Management Limits for TPH Fractions - NEPC (2013) *National Environment Protection (Assessment of Site Contamination) Measure 1999*
'COARSE' soil texture criteria adopted.

PQL: Practical Quantification Limit
nd: Concentration below PQL
- : Not applicable

BOLD Above ESL
Above HSL (Vapour Intrusion)
Above HSL (Management Limits)

Table 5
Detailed Site Investigation - 45 Mitchell Road Brookvale
Soil Analytical Results - Polycyclic Aromatic Hydrocarbons

All units in mg/kg

Sample ID	Depth	Sampling Date	Polycyclic Aromatic Hydrocarbons																	
			Total PAH	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b & j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	B(a)P TEQ
PQL			**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
Environmental Investigation Levels[1]			**-**	**-**	**-**	**-**	**-**	**0.7 [5]**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**370 [3]**	**-**	**-**	**-**
Health Investigation Levels[2]			**4,000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**40 [4]**
MW1/0.6	0.6	6/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.6
MW1/2.0	0.2	6/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.6
MW2/1.0	1	6/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.6
MW2/3.0	3	6/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.6
BH1A/1	1	6/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.6
BH1A/3	3	6/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.6
BH2/0.9	0.9	6/08/2020	6.4	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	6.4	nd	nd	0.6
BH2A/3.0	3	6/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.6
BH3/0.5	0.5	6/08/2020	4.4	nd	nd	nd	nd	0.6	0.5	nd	0.6	0.5	nd	1.1	nd	nd	nd	nd	1.1	1
QA1	-	6/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.6

[1] Environmental Investigation Levels (EILs) - NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999.
Commercial and industrial setting

[2] Health Investigation Levels (HILs) - NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999
HIL D: Commercial/industrial, includes premises such as shops, offices, factories and industrial sites.

[3] Generic EIL adopted for fresh contaminants in soil.

[4] HIL based on the 8 carcinogenic PAHs and their TEFs [potency relative to B(a)P]. The B(a)P TEQ is calculated by multiplying the concentration of each carcinogenic PAH in the sample by its B(a)P TEF and summing these products.
Where the B(a)P occurs in bitumen fragments it is relatively immobile and does not represent a significant health risk.

[5] Environmental Screening Levels (ESLs) - NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999.
Commercial and industrial setting
Owing to the presence of sand, the 'COARSE' soil type assessment criteria have been adopted.

BOLD Above EIL

Above HIL

PQL: Practical Quantification Limit
nd: Concentration below PQL
- : Not applicable

Table 6
Detailed Site Investigation - 45 Mitchell Road Brookvale
Soil Analytical Results - Polycyclic Aromatic Hydrocarbons

All units in mg/kg

Z:\METECH CONSULTING\EP - Projects\EP147 - Brookvale (Mitchell Rd)\08 Report\EP147_RP02 - DSI\Results Tables\[EP147_RP01 - Appendix D - Result Tables.xlsx]6. Soil-OCP

Sample ID	Depth	Sampling Date	Organochlorine Pesticides (OCPs)																						
			Chlordanes - Total	4.4'-DDD	4.4'-DDE	4.4'-DDT	a-BHC	Aldrin	b-BHC	d-BHC	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene (HCB)	Methoxychlor	Toxaphene	Aldrin and Dieldrin (Total)	DDT + DDE + DDD (Total)
PQL			0.10	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.20	1	0.05	0.05
Environmental Investigation Levels[1]			-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	640
Health Investigation Levels[2]			530	-	-	-	-	-	-	-	-	2000 [5]	2000 [5]	-	100	-	-	-	50	-	80	2500	160	45 [4]	3600 [3]
BH1A/0.5	0.5	6/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
BH3/0.5	0.5	6/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

[1] Environmental Investigation Levels (EILs) - NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999. Commercial and industrial setting

[2] Health Investigation Levels (HILs) - NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999
HIL D: Commercial/industrial, includes premises such as shops, offices, factories and industrial sites.

[3] Sum of DDT, DDE and DDD

[4] Sum of Aldrin and Dieldrin

[5] Sum of Endosulfan

[6] Sum of Chlordane

[7] Sum of DDT

nd: Concentration below PQL

- : Not applicable

BOLD Above EIL

Above HIL

Table 7
Detailed Site Investigation - 45 Mitchell Road Brookvale
Soil Analytical Results - Organophosphorus Pesticides (OPPs)

All units in mg/kg

Z:\METECH CONSULTING\EP - Projects\EP147 - Brookvale (Mitchell Rd)\08 Report\EP147_RP02 - DSI\Results Tables\[EP147_RP01 - Appendix D - Result Tables.xlsx]7. Soil-OPP

Sample ID	Depth	Sampling Date	Organophosphorus Pesticides (OPPs)																						
			Azinphos-methyl	Bolstar	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos	Demeton-O	Demeton-S	Diazinon	Dichlorvos	Dimethoate	Disulfoton	EPN	Ethion	Ethoprop	Ethyl parathion	Fenitrothion	Fensulfothion	Fenthion	Malathion	Merphos	Methyl parathion	Mevinphos
PQL			0.2	0.2	0.2	0.2	0.2	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Environmental Investigation Levels[1]			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Health Investigation Levels[1]			-	-	-	2000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH1A/0.5	0.5	6/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
BH3/0.5	0.5	6/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

Sample ID	Depth	Sampling Date	Organophosphorus Pesticides (OPPs)										
			Monocrotophos	Naled	Omethoate	Phorate	Pirimiphos-methyl	Pyrazophos	Ronnel	Terbufos	Tetrachlorvinphos	Tokuthion	Trichloronate
PQL			2	0.2	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Environmental Investigation Levels[1]			-	-	-	-	-	-	-	-	-	-	-
Health Investigation Levels[1]			-	-	-	-	-	-	-	-	-	-	-
BH1A/0.5	0.5	6/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
BH3/0.5	0.5	6/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

[1] Environmental Investigation Levels (EILs) - NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999. Commercial and industrial setting

[2] Health Investigation Levels (HILs) - NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999
HIL D: Commercial/industrial, includes premises such as shops, offices, factories and industrial sites.

PQL: Practical Quantification Limit

Above HIL

Table 8
Detailed Site Investigation - 45 Mitchell Road Brookvale
Groundwater Analytical Results - Heavy Metals

All units in ug/L

Z:\METECH CONSULTING\EP - Projects\EP147 - Brookvale (Mitchell Rd)\08 Report\EP147_RP02 - DSI\Results Tables\[EP147_RP01 - Appendix D - Result Tables.xlsx]8. GW-Metals

Sample ID	Sampling Date	Metals							
		Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Copper (Cu)	Lead (Pb)	Mercury (Hg)	Nickel (Ni)	Zinc (Zn)
PQL		1.0	0.2	1.0	1.0	1.0	0.1	1.0	5.0
Groundwater Investigation Levels - Environment[1]		13 [2]	0.2	1 [3]	1.4	3.4	0.06 [4]	11	8 [3]
Human Health Criteria - Drinking Water [2]		10	2	50	2000	10	1	20	-
MW1	11/08/2020	nd	nd	nd	nd	nd	nd	nd	nd
MW2	11/08/2020	nd	nd	nd	8	nd	nd	2	190
QA3	11/08/2020	nd	nd	nd	5	nd	nd	nd	8

[1] Groundwater Investigation Levels (GILs) - NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999.
Freshwater trigger value for slightly-moderately disturbed systems (95% protection levels) (refer ANZECC & ARMCANZ 2000).
[2] Total As concentration reported, therefore the As(V) value has been conservatively adopted as the initial screening value.
[3] Figure may not protect key species from chronic toxicity, refer to ANZECC & ARMCANZ (2000) for further guidance.
[4] Chemical for which possible bioaccumulation and secondary poisoning effects should be considered, refer to ANZECC & ARMCANZ (2000) for further guidance.

Above Freshwater Criteria
Above HSL

PQL: Practical Quantification Limit
nd: Concentration below PQL
- : Not applicable

Table 9
Detailed Site Investigation - 45 Mitchell Road Brookvale
Groundwater Analytical Results - Volatile Total Recoverable Hydrocarbons

All units in ug/L

Z:\METECH CONSULTING\EP - Projects\EP147 - Brookvale (Mitchell Rd)\08 Report\EP147_RP02 - DSI\Results Tables\[EP147_RP01 - Appendix D - Result Tables.xlsx]9. GW-vTRH

Sample ID	Sampling Date	Volatile Total Recoverable Hydrocarbons (vTRH/BTEXN)								
		C_6-C_9	C_6-C_{10}	F1 (C6-C10 less BTEX)	Benzene	Toluene	Ethylbenzene	m+p-Xylene	o-Xylene	Naphthalene
PQL		20	50	20	1	1	1	2	1	10
Groundwater Investigation Levels - Environment[1]		-	-	-	950	-	-	200	350	16
Human Health Criteria - Drinking Water [2]		-	-	-	1	800	300	600		-
Health Screening Levels - Vapour Intrusion (2 - <4m)[3]		-	-	6,000	5,000	-	-	-		-
MW1	11/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW2	11/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd
QA3	11/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd

[1] Groundwater Investigation Levels (GILs) - NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999.
Freshwater trigger values for slightly-moderately disturbed systems (95% protection levels) (refer ANZECC & ARMCANZ 2000).
[2] Groundwater Investigation Levels (GILs) - NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999.
Drinking Water trigger values
[3] Health Screening Levels (HSLs) for Vapour Intrusion - NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999.
Commercial / industrial land use setting, 'SAND' criteria has been adopted based on site geological conditions.

Above Freshwater Criteria
Bold Above Drinking Water Criteria
Above HSL

PQL: Practical Quantification Limit
nd: Concentration below PQL
- : Not applicable
NL: Not Limiting

Table 10
Detailed Site Investigation - 45 Mitchell Road Brookvale
Groundwater Analytical Results - Semi-Volatile Total Recoverable Hydrocarbons

All units in ug/L

Z:\METECH CONSULTING\EP - Projects\EP147 - Brookvale (Mitchell Rd)\08 Report\EP147_RP02 - DSI\Results Tables\[EP147_RP01 - Appendix D - Result Tables.xlsx]10. GW-svTRH

Sample ID	Sampling Date	Semi-Volatile Total Recoverable Hydrocarbons (svTRH/BTEXN)						
		C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	>C_{10}-C_{16}	F2 >C10-C16 less Naphthalene	F3 >C_{16}-C_{34}	F4 >C_{34}-C_{40}
PQL		**50**	**100**	**100**	**50**	**50**	**100**	**100**
Groundwater Investigation Levels - Environment[1]		-	-	-	-	-	-	-
Health Screening Levels - Vapour Intrusion (2 - <4m)[2]		-	-	-	-	-	-	-
MW1	11/08/2020	nd	nd	nd	nd	nd	nd	nd
MW2	11/08/2020	nd	nd	nd	nd	nd	nd	nd
QA3	11/08/2020	nd	nd	nd	nd	nd	nd	nd

[1] Groundwater Investigation Levels (GILs) - NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999.
Freshwater trigger value for slightly-moderately disturbed systems (95% protection levels) (refer ANZECC & ARMCANZ 2000).

[2] Health Screening Levels (HSLs) for Vapour Intrusion - NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999.
Commercial / industrial land use setting, 'SAND' criteria has been adopted based on site geological conditions.

Above Freshwater Criteria

Above HSL

PQL: Practical Quantification Limit
nd: Concentration below PQL
- : Not applicable
NL: Not Limiting

Table 11
Detailed Site Investigation - 45 Mitchell Road Brookvale
Groundwater Analytical Results - Polycyclic Aromatic Hydrocarbons

All units in ug/L

Z:\METECH CONSULTING\EP - Projects\EP147 - Brookvale (Mitchell Rd)\08 Report\EP147_RP02 - DSI\Results Tables\[EP147_RP01 - Appendix D - Result Tables.xlsx]11. GW-PAH

Sample ID	Sampling Date	Polycyclic Aromatic Hydrocarbons																
		Total PAH	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b&j)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(ah)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene
PQL		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Groundwater Investigation Levels - Environment[1]		-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-	-
Human Health Criteria - Drinking Water [2]		-	-	-	-	-	0.01	-	-		-	-	-	-	-	-	-	-
Health Screening Levels - Vapour Intrusion (2 - <4m)[3]		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW1	11/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW2	11/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
QA3	11/08/2020	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

[1] Groundwater Investigation Levels (GILs) - NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999.
Freshwater trigger value for slightly-moderately disturbed systems (95% protection levels) (refer ANZECC & ARMCANZ 2000).
[2] Groundwater Investigation Levels (GILs) - NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999.
Drinking Water trigger values
[3] Health Screening Levels (HSLs) for Vapour Intrusion - NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999.
Commercial / industrial land use setting, 'SAND' criteria has been adopted based on site geological conditions.

Above Freshwater Criteria
Bold Above Drinking Water Criteria
Above HSL

PQL: Practical Quantification Limit
nd: Concentration below PQL
- : Not applicable
NL: Not Limiting

Table 12
Detailed Site Investigation - 45 Mitchell Road Brookvale
Relative Percentage Difference Calculations - Metals

All units in mg/kg, except RPDs Z:\METECH CONSULTING\EP - Projects\EP147 - Brookvale (Mitchell Rd)\08 Report\EP147_RP02 - DSI\Results Tables\[EP147_RP01 - Appendix D - Result Tables.xlsx]12. RPD - Metals

Type	Sample ID	Metals							
		Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Copper (Cu)	Lead (Pb)	Mercury (Hg)	Nickel (Ni)	Zinc (Zn)
Original	MW1	nd	nd	nd	**1**	nd	nd	nd	**5**
Duplicate	QA3	nd	nd	nd	5	nd	nd	nd	8
RPDs (Dup.)	-	**N/A**	**N/A**	**N/A**	**133**	**N/A**	**N/A**	**N/A**	**46**

BOLD = PQL used to calculate RPD value

Table 13
Detailed Site Investigation - 45 Mitchell Road Brookvale
Relative Percentage Difference Calculations - Total Recoverable Hydrocarbons

All units in mg/kg, except RPDs

Z:\METECH CONSULTING\EP - Projects\EP147 - Brookvale (Mitchell Rd)\08 Report\EP147_RP02 - DSI\Results Tables\[EP147_RP01 - Appendix D - Result Tables.xlsx]13. RPD - TRH

Type	Sample ID	Volatile Total Recoverable Hydrocarbons (vTRH/BTEXN)								
		C_6-C_9	C_6-C_{10}	F1 (C6-C10 less BTEX)	Benzene	Toluene	Ethylbenzene	m+p-Xylene	o-Xylene	Napthalene
Original	MW1/2.0	nd	nd	nd	nd	nd	nd	nd	nd	nd
Duplicate	QA1	nd	nd	nd	nd	nd	nd	nd	nd	nd
RPDs (Dup.)	-	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Original	MW1	nd	nd	nd	nd	nd	nd	nd	nd	nd
Duplicate	QA3	nd	nd	nd	nd	nd	nd	nd	nd	nd
RPDs (Dup.)	-	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

Type	Sample ID	Semi-Volatile Total Recoverable Hydrocarbons (svTRH/BTEXN)						
		C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	>C_{10}-C_{16}	F2 >C10-C16 less Naphthalene	F3 >C_{16}-C_{34}	F4 >C_{34}-C_{40}
Original	MW1/2.0	nd	nd	nd	nd	nd	nd	nd
Duplicate	QA1	nd	nd	nd	nd	nd	nd	nd
RPDs (Dup.)	-	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Original	MW1	nd	nd	nd	nd	nd	nd	nd
Duplicate	QA3	nd	nd	nd	nd	nd	nd	nd
RPDs (Dup.)	-	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

BOLD = PQL used to calculate RPD value

Table 14
Detailed Site Investigation - 45 Mitchell Road Brookvale
Relative Percentage Difference Calculations - Polycyclic Aromatic Hydrocarbons

All units in mg/kg, except RPDs Z:\METECH CONSULTING\EP - Projects\EP147 - Brookvale (Mitchell Rd)\08 Report\EP147_RP02 - DSI\Results Tables\[EP147_RP01 - Appendix D - Result Tables.xlsx]13. RPD - TRH

Type	Sample ID	Polycyclic Aromatic Hydrocarbons																	
		Total PAH	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b & j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	B(a)P TEQ
Original	MW1/2.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.6
Duplicate	QA1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.6
RPDs (Dup.)	-	**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**	**N/A**	**N/A**	**N/A**	**N/A**	**0**
Original	MW1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-
Duplicate	QA3	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-
RPDs (Dup.)	-	**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**	**N/A**	**N/A**	**N/A**	**N/A**	-

BOLD = PQL used to calculate RPD value

Appendix E
Laboratory Certificates

eurofins | Environment Testing

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

Australia

Melbourne
6 Monterey Road
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Site # 1254 & 14271

Sydney
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NATA # 1261 Site # 18217

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

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

Newcastle
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Phone : +61 2 4968 8448

New Zealand

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Phone : +64 9 526 45 51
IANZ # 1327

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

Sample Receipt Advice

Company name:	Metech Consulting Pty Ltd
Contact name:	Michelle Battam
Project name:	BROOKVALE (MITCHELL RD)
Project ID:	EP147
Turnaround time:	5 Day
Date/Time received	Aug 7, 2020 5:41 PM
Eurofins reference	736726

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.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Unlabelled bag received extra and placed on hold.
Samples received by the laboratory after 5.30pm are deemed to have been received the following working day.

Contact

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

Alena Bounkeua on Phone : or by email: AlenaBounkeua@eurofins.com

Results will be delivered electronically via email to Michelle Battam - mbattam@metech.consulting.

Note: A copy of these results will also be delivered to the general Metech Consulting Pty Ltd email address.

eurofins | Environment Testing

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

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Company Name: Metech Consulting Pty Ltd
Address: PO Box 1184
Sutherland
NSW 1499

Project Name: BROOKVALE (MITCHELL RD)
Project ID: EP147

Order No.:
Report #: 736726
Phone: (02)9575 7755
Fax:

Received: Aug 7, 2020 5:41 PM
Due: Aug 14, 2020
Priority: 5 Day
Contact Name: Michelle Battam

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						HOLD	Suite B14: OCP/OPP	Moisture Set	Eurofins Suite B10	Eurofins Suite B7	Eurofins Suite B4
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											
Newcastle Laboratory											
External Laboratory											
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
1	MW1/0.6	Aug 06, 2020		Soil	S20-Au11642			X		X	
2	MW1/2.0	Aug 06, 2020		Soil	S20-Au11643			X			X
3	MW2/1.0	Aug 06, 2020		Soil	S20-Au11644			X		X	
4	MW2/3.0	Aug 06, 2020		Soil	S20-Au11645			X			X
5	BH1A/0.5	Aug 06, 2020		Soil	S20-Au11646		X	X			
6	BH1A/1.0	Aug 06, 2020		Soil	S20-Au11647			X		X	
7	BH1A/3.0	Aug 06, 2020		Soil	S20-Au11648			X			X
8	BH2/0.9	Aug 06, 2020		Soil	S20-Au11649			X		X	
9	BH2A/3.0	Aug 06, 2020		Soil	S20-Au11650			X			X

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

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IANZ # 1327

Christchurch
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Rolleston, Christchurch 7675
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IANZ # 1290

Company Name: Metech Consulting Pty Ltd
Address: PO Box 1184
Sutherland
NSW 1499

Project Name: BROOKVALE (MITCHELL RD)
Project ID: EP147

Order No.:
Report #: 736726
Phone: (02)9575 7755
Fax:

Received: Aug 7, 2020 5:41 PM
Due: Aug 14, 2020
Priority: 5 Day
Contact Name: Michelle Battam

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						HOLD	Suite B14: OCP/OPP	Moisture Set	Eurofins Suite B10	Eurofins Suite B7	Eurofins Suite B4
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	BH3/0.5	Aug 07, 2020		Soil	S20-Au11651			X	X		
11	QA1	Aug 06, 2020		Soil	S20-Au11652			X			X
12	MW1/1.0	Aug 06, 2020		Soil	S20-Au11653	X					
13	MW1/2.7	Aug 06, 2020		Soil	S20-Au11654	X					
14	MW1/3.5	Aug 06, 2020		Soil	S20-Au11655	X					
15	MW1/4.0	Aug 06, 2020		Soil	S20-Au11656	X					
16	MW2/2.0	Aug 06, 2020		Soil	S20-Au11657	X					
17	MW2/3.9	Aug 06, 2020		Soil	S20-Au11658	X					
18	MW2/5.0	Aug 06, 2020		Soil	S20-Au11659	X					
19	BH1A/2.0	Aug 06, 2020		Soil	S20-Au11660	X					
20	BH1A/3.9	Aug 06, 2020		Soil	S20-Au11661	X					
21	BH1A/4.5	Aug 06, 2020		Soil	S20-Au11662	X					
22	BH1A/5.4	Aug 06, 2020		Soil	S20-Au11663	X					

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Project Name: BROOKVALE (MITCHELL RD)
Project ID: EP147

Order No.:
Report #: 736726
Phone: (02)9575 7755
Fax:

Received: Aug 7, 2020 5:41 PM
Due: Aug 14, 2020
Priority: 5 Day
Contact Name: Michelle Battam

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						HOLD	Suite B14: OCP/OPP	Moisture Set	Eurofins Suite B10	Eurofins Suite B7	Eurofins Suite B4
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											
23	BH2/1.5	Aug 06, 2020		Soil	S20-Au11664	X					
24	BH2/1.9	Aug 06, 2020		Soil	S20-Au11665	X					
25	BH2A/2.5	Aug 06, 2020		Soil	S20-Au11666	X					
26	BH2A/4.0	Aug 06, 2020		Soil	S20-Au11667	X					
27	BH2A/5.5	Aug 06, 2020		Soil	S20-Au11668	X					
28	BH2A/6.0	Aug 06, 2020		Soil	S20-Au11669	X					
29	BH3/1.0	Aug 07, 2020		Soil	S20-Au11670	X					
30	QA2	Aug 06, 2020		Soil	S20-Au11671	X					
31	UNLABELLED	Aug 06, 2020		Soil	S20-Au11672	X					
Test Counts						20	1	11	1	4	5

Metech Consulting Pty Ltd
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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: **Michelle Battam**

Report **736726-S**
Project name BROOKVALE (MITCHELL RD)
Project ID EP147
Received Date Aug 07, 2020

Client Sample ID			**MW1/0.6**	**MW1/2.0**	**MW2/1.0**	**MW2/3.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Au11642**	**S20-Au11643**	**S20-Au11644**	**S20-Au11645**
Date Sampled			**Aug 06, 2020**	**Aug 06, 2020**	**Aug 06, 2020**	**Aug 06, 2020**
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	< 50
TRH C10-C36 (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	%	89	101	103	100
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
TRH >C10-C40 (total)*	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

Client Sample ID			MW1/0.6	MW1/2.0	MW2/1.0	MW2/3.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Au11642	S20-Au11643	S20-Au11644	S20-Au11645
Date Sampled			Aug 06, 2020	Aug 06, 2020	Aug 06, 2020	Aug 06, 2020
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
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	%	114	113	114	113
p-Terphenyl-d14 (surr.)	1	%	119	115	118	116
Heavy Metals						
Arsenic	2	mg/kg	2.8	-	7.9	-
Cadmium	0.4	mg/kg	< 0.4	-	< 0.4	-
Chromium	5	mg/kg	25	-	17	-
Copper	5	mg/kg	< 5	-	8.3	-
Lead	5	mg/kg	35	-	61	-
Mercury	0.1	mg/kg	0.1	-	0.3	-
Nickel	5	mg/kg	5.3	-	< 5	-
Zinc	5	mg/kg	8.9	-	89	-
% Moisture	1	%	22	13	20	21

Client Sample ID			BH1A/0.5	BH1A/1.0	BH1A/3.0	BH2/0.9
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Au11646	S20-Au11647	S20-Au11648	S20-Au11649
Date Sampled			Aug 06, 2020	Aug 06, 2020	Aug 06, 2020	Aug 06, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	< 20	380
TRH C10-C14	20	mg/kg	-	< 20	< 20	110
TRH C15-C28	50	mg/kg	-	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	-	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	-	< 50	< 50	110
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	< 0.1	0.5
Toluene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1	< 0.1	0.5
m&p-Xylenes	0.2	mg/kg	-	< 0.2	< 0.2	0.4
o-Xylene	0.1	mg/kg	-	< 0.1	< 0.1	0.1
Xylenes - Total*	0.3	mg/kg	-	< 0.3	< 0.3	0.5
4-Bromofluorobenzene (surr.)	1	%	-	93	82	71
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	< 0.5	14
TRH C6-C10	20	mg/kg	-	< 20	< 20	450
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	< 20	450
TRH >C10-C16	50	mg/kg	-	< 50	< 50	130
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	< 50	116
TRH >C16-C34	100	mg/kg	-	< 100	< 100	< 100

Client Sample ID			BH1A/0.5	BH1A/1.0	BH1A/3.0	BH2/0.9
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Au11646	S20-Au11647	S20-Au11648	S20-Au11649
Date Sampled			Aug 06, 2020	Aug 06, 2020	Aug 06, 2020	Aug 06, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C34-C40	100	mg/kg	-	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	-	< 100	< 100	130
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
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	6.4
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	6.4
2-Fluorobiphenyl (surr.)	1	%	-	110	100	116
p-Terphenyl-d14 (surr.)	1	%	-	109	105	121
Heavy Metals						
Arsenic	2	mg/kg	-	3.4	-	< 2
Cadmium	0.4	mg/kg	-	< 0.4	-	< 0.4
Chromium	5	mg/kg	-	16	-	7.9
Copper	5	mg/kg	-	17	-	5.3
Lead	5	mg/kg	-	58	-	15
Mercury	0.1	mg/kg	-	0.2	-	< 0.1
Nickel	5	mg/kg	-	< 5	-	11
Zinc	5	mg/kg	-	160	-	22
% Moisture	1	%	14	27	16	20
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	-	-	-

Client Sample ID			BH1A/0.5	BH1A/1.0	BH1A/3.0	BH2/0.9
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Au11646	S20-Au11647	S20-Au11648	S20-Au11649
Date Sampled			Aug 06, 2020	Aug 06, 2020	Aug 06, 2020	Aug 06, 2020
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
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	< 0.2	-	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	-	-	-
Dibutylchlorendate (surr.)	1	%	101	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	118	-	-	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	-	-
Bolstar	0.2	mg/kg	< 0.2	-	-	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	-	-
Chlorpyrifos	0.2	mg/kg	< 0.2	-	-	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	-	-
Coumaphos	2	mg/kg	< 2	-	-	-
Demeton-S	0.2	mg/kg	< 0.2	-	-	-
Demeton-O	0.2	mg/kg	< 0.2	-	-	-
Diazinon	0.2	mg/kg	< 0.2	-	-	-
Dichlorvos	0.2	mg/kg	< 0.2	-	-	-
Dimethoate	0.2	mg/kg	< 0.2	-	-	-
Disulfoton	0.2	mg/kg	< 0.2	-	-	-
EPN	0.2	mg/kg	< 0.2	-	-	-
Ethion	0.2	mg/kg	< 0.2	-	-	-
Ethoprop	0.2	mg/kg	< 0.2	-	-	-
Ethyl parathion	0.2	mg/kg	< 0.2	-	-	-
Fenitrothion	0.2	mg/kg	< 0.2	-	-	-
Fensulfothion	0.2	mg/kg	< 0.2	-	-	-
Fenthion	0.2	mg/kg	< 0.2	-	-	-
Malathion	0.2	mg/kg	< 0.2	-	-	-
Merphos	0.2	mg/kg	< 0.2	-	-	-
Methyl parathion	0.2	mg/kg	< 0.2	-	-	-
Mevinphos	0.2	mg/kg	< 0.2	-	-	-
Monocrotophos	2	mg/kg	< 2	-	-	-
Naled	0.2	mg/kg	< 0.2	-	-	-
Omethoate	2	mg/kg	< 2	-	-	-
Phorate	0.2	mg/kg	< 0.2	-	-	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	-	-
Pyrazophos	0.2	mg/kg	< 0.2	-	-	-
Ronnel	0.2	mg/kg	< 0.2	-	-	-
Terbufos	0.2	mg/kg	< 0.2	-	-	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	-	-
Tokuthion	0.2	mg/kg	< 0.2	-	-	-

Client Sample ID			BH1A/0.5	BH1A/1.0	BH1A/3.0	BH2/0.9
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Au11646	S20-Au11647	S20-Au11648	S20-Au11649
Date Sampled			Aug 06, 2020	Aug 06, 2020	Aug 06, 2020	Aug 06, 2020
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Trichloronate	0.2	mg/kg	< 0.2	-	-	-
Triphenylphosphate (surr.)	1	%	109	-	-	-

Client Sample ID			BH2A/3.0	BH3/0.5	QA1
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S20-Au11650	S20-Au11651	S20-Au11652
Date Sampled			Aug 06, 2020	Aug 07, 2020	Aug 06, 2020
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	20	mg/kg	< 20	< 20	< 20
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-C36 (Total)	50	mg/kg	< 50	< 50	< 50
BTEX					
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	0.6	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	69	82	97
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20
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
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons					
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	0.7	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	1.0	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.3	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	0.6	< 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	0.6	< 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
Fluoranthene	0.5	mg/kg	< 0.5	1.1	< 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

Client Sample ID			BH2A/3.0	BH3/0.5	QA1
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S20-Au11650	S20-Au11651	S20-Au11652
Date Sampled			Aug 06, 2020	Aug 07, 2020	Aug 06, 2020
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
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	1.1	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	4.4	< 0.5
2-Fluorobiphenyl (surr.)	1	%	111	124	52
p-Terphenyl-d14 (surr.)	1	%	115	132	50
Heavy Metals					
Arsenic	2	mg/kg	-	< 2	-
Cadmium	0.4	mg/kg	-	< 0.4	-
Chromium	5	mg/kg	-	14	-
Copper	5	mg/kg	-	< 5	-
Lead	5	mg/kg	-	15	-
Mercury	0.1	mg/kg	-	< 0.1	-
Nickel	5	mg/kg	-	< 5	-
Zinc	5	mg/kg	-	12	-
% Moisture	1	%	17	16	16
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	-	< 0.2	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.2	-
Dibutylchlorendate (surr.)	1	%	-	INT	-
Tetrachloro-m-xylene (surr.)	1	%	-	120	-

Client Sample ID			BH2A/3.0	BH3/0.5	QA1
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S20-Au11650	S20-Au11651	S20-Au11652
Date Sampled			Aug 06, 2020	Aug 07, 2020	Aug 06, 2020
Test/Reference	LOR	Unit			
Organophosphorus Pesticides					
Azinphos-methyl	0.2	mg/kg	-	< 0.2	-
Bolstar	0.2	mg/kg	-	< 0.2	-
Chlorfenvinphos	0.2	mg/kg	-	< 0.2	-
Chlorpyrifos	0.2	mg/kg	-	< 0.2	-
Chlorpyrifos-methyl	0.2	mg/kg	-	< 0.2	-
Coumaphos	2	mg/kg	-	< 2	-
Demeton-S	0.2	mg/kg	-	< 0.2	-
Demeton-O	0.2	mg/kg	-	< 0.2	-
Diazinon	0.2	mg/kg	-	< 0.2	-
Dichlorvos	0.2	mg/kg	-	< 0.2	-
Dimethoate	0.2	mg/kg	-	< 0.2	-
Disulfoton	0.2	mg/kg	-	< 0.2	-
EPN	0.2	mg/kg	-	< 0.2	-
Ethion	0.2	mg/kg	-	< 0.2	-
Ethoprop	0.2	mg/kg	-	< 0.2	-
Ethyl parathion	0.2	mg/kg	-	< 0.2	-
Fenitrothion	0.2	mg/kg	-	< 0.2	-
Fensulfothion	0.2	mg/kg	-	< 0.2	-
Fenthion	0.2	mg/kg	-	< 0.2	-
Malathion	0.2	mg/kg	-	< 0.2	-
Merphos	0.2	mg/kg	-	< 0.2	-
Methyl parathion	0.2	mg/kg	-	< 0.2	-
Mevinphos	0.2	mg/kg	-	< 0.2	-
Monocrotophos	2	mg/kg	-	< 2	-
Naled	0.2	mg/kg	-	< 0.2	-
Omethoate	2	mg/kg	-	< 2	-
Phorate	0.2	mg/kg	-	< 0.2	-
Pirimiphos-methyl	0.2	mg/kg	-	< 0.2	-
Pyrazophos	0.2	mg/kg	-	< 0.2	-
Ronnel	0.2	mg/kg	-	< 0.2	-
Terbufos	0.2	mg/kg	-	< 0.2	-
Tetrachlorvinphos	0.2	mg/kg	-	< 0.2	-
Tokuthion	0.2	mg/kg	-	< 0.2	-
Trichloronate	0.2	mg/kg	-	< 0.2	-
Triphenylphosphate (surr.)	1	%	-	131	-

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Eurofins Suite B4			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Aug 12, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Aug 12, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Aug 12, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Aug 12, 2020	
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Aug 12, 2020	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Sydney	Aug 12, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	Aug 07, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			
Organochlorine Pesticides	Sydney	Aug 12, 2020	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Sydney	Aug 12, 2020	14 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			

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Company Name: Metech Consulting Pty Ltd
Address: PO Box 1184
Sutherland
NSW 1499

Project Name: BROOKVALE (MITCHELL RD)
Project ID: EP147

Order No.:
Report #: 736726
Phone: (02)9575 7755
Fax:

Received: Aug 7, 2020 5:41 PM
Due: Aug 14, 2020
Priority: 5 Day
Contact Name: Michelle Battam

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						HOLD	Suite B14: OCP/OPP	Moisture Set	Eurofins Suite B10	Eurofins Suite B7	Eurofins Suite B4
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											
Newcastle Laboratory											
External Laboratory											
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
1	MW1/0.6	Aug 06, 2020		Soil	S20-Au11642			X		X	
2	MW1/2.0	Aug 06, 2020		Soil	S20-Au11643			X			X
3	MW2/1.0	Aug 06, 2020		Soil	S20-Au11644			X		X	
4	MW2/3.0	Aug 06, 2020		Soil	S20-Au11645			X			X
5	BH1A/0.5	Aug 06, 2020		Soil	S20-Au11646		X	X			
6	BH1A/1.0	Aug 06, 2020		Soil	S20-Au11647			X		X	
7	BH1A/3.0	Aug 06, 2020		Soil	S20-Au11648			X			X
8	BH2/0.9	Aug 06, 2020		Soil	S20-Au11649			X		X	
9	BH2A/3.0	Aug 06, 2020		Soil	S20-Au11650			X			X

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Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
10	BH3/0.5	Aug 07, 2020		Soil	S20-Au11651			X	X		
11	QA1	Aug 06, 2020		Soil	S20-Au11652			X			X
12	MW1/1.0	Aug 06, 2020		Soil	S20-Au11653	X					
13	MW1/2.7	Aug 06, 2020		Soil	S20-Au11654	X					
14	MW1/3.5	Aug 06, 2020		Soil	S20-Au11655	X					
15	MW1/4.0	Aug 06, 2020		Soil	S20-Au11656	X					
16	MW2/2.0	Aug 06, 2020		Soil	S20-Au11657	X					
17	MW2/3.9	Aug 06, 2020		Soil	S20-Au11658	X					
18	MW2/5.0	Aug 06, 2020		Soil	S20-Au11659	X					
19	BH1A/2.0	Aug 06, 2020		Soil	S20-Au11660	X					
20	BH1A/3.9	Aug 06, 2020		Soil	S20-Au11661	X					
21	BH1A/4.5	Aug 06, 2020		Soil	S20-Au11662	X					
22	BH1A/5.4	Aug 06, 2020		Soil	S20-Au11663	X					

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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											
23	BH2/1.5	Aug 06, 2020		Soil	S20-Au11664	X					
24	BH2/1.9	Aug 06, 2020		Soil	S20-Au11665	X					
25	BH2A/2.5	Aug 06, 2020		Soil	S20-Au11666	X					
26	BH2A/4.0	Aug 06, 2020		Soil	S20-Au11667	X					
27	BH2A/5.5	Aug 06, 2020		Soil	S20-Au11668	X					
28	BH2A/6.0	Aug 06, 2020		Soil	S20-Au11669	X					
29	BH3/1.0	Aug 07, 2020		Soil	S20-Au11670	X					
30	QA2	Aug 06, 2020		Soil	S20-Au11671	X					
31	UNLABELLED	Aug 06, 2020		Soil	S20-Au11672	X					
Test Counts						20	1	11	1	4	5

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
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							
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	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	84			70-130	Pass	
TRH C10-C14	%	88			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	99			70-130	Pass	
Toluene	%	96			70-130	Pass	
Ethylbenzene	%	97			70-130	Pass	
m&p-Xylenes	%	98			70-130	Pass	
o-Xylene	%	100			70-130	Pass	
Xylenes - Total*	%	99			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	83			70-130	Pass	
TRH C6-C10	%	83			70-130	Pass	
TRH >C10-C16	%	93			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	98			70-130	Pass	
Acenaphthylene	%	95			70-130	Pass	
Anthracene	%	99			70-130	Pass	
Benz(a)anthracene	%	89			70-130	Pass	
Benzo(a)pyrene	%	93			70-130	Pass	
Benzo(b&j)fluoranthene	%	94			70-130	Pass	
Benzo(g.h.i)perylene	%	94			70-130	Pass	
Benzo(k)fluoranthene	%	95			70-130	Pass	
Chrysene	%	97			70-130	Pass	
Dibenz(a.h)anthracene	%	85			70-130	Pass	
Fluoranthene	%	96			70-130	Pass	
Fluorene	%	99			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	85			70-130	Pass	
Naphthalene	%	96			70-130	Pass	
Phenanthrene	%	97			70-130	Pass	
Pyrene	%	98			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	110			80-120	Pass	
Cadmium	%	112			80-120	Pass	
Chromium	%	112			80-120	Pass	
Copper	%	110			80-120	Pass	
Lead	%	114			80-120	Pass	
Mercury	%	105			80-120	Pass	
Nickel	%	113			80-120	Pass	
Zinc	%	107			80-120	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	83			70-130	Pass	
4.4'-DDD	%	78			70-130	Pass	
4.4'-DDE	%	87			70-130	Pass	
4.4'-DDT	%	88			70-130	Pass	
a-BHC	%	84			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Aldrin	%	86			70-130	Pass	
b-BHC	%	84			70-130	Pass	
d-BHC	%	86			70-130	Pass	
Dieldrin	%	91			70-130	Pass	
Endosulfan I	%	86			70-130	Pass	
Endosulfan II	%	84			70-130	Pass	
Endosulfan sulphate	%	79			70-130	Pass	
Endrin	%	86			70-130	Pass	
Endrin aldehyde	%	90			70-130	Pass	
Endrin ketone	%	84			70-130	Pass	
g-BHC (Lindane)	%	85			70-130	Pass	
Heptachlor	%	83			70-130	Pass	
Heptachlor epoxide	%	76			70-130	Pass	
Hexachlorobenzene	%	81			70-130	Pass	
Methoxychlor	%	84			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	99			70-130	Pass	
Dimethoate	%	94			70-130	Pass	
Ethion	%	114			70-130	Pass	
Fenitrothion	%	117			70-130	Pass	
Methyl parathion	%	128			70-130	Pass	
Mevinphos	%	106			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	W20-Au12600	NCP	%	71			70-130	Pass	
TRH C10-C14	W20-Au12605	NCP	%	73			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	W20-Au12600	NCP	%	93			70-130	Pass	
Toluene	W20-Au12600	NCP	%	89			70-130	Pass	
Ethylbenzene	W20-Au12600	NCP	%	91			70-130	Pass	
m&p-Xylenes	W20-Au12600	NCP	%	94			70-130	Pass	
o-Xylene	W20-Au12600	NCP	%	97			70-130	Pass	
Xylenes - Total*	W20-Au12600	NCP	%	95			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	W20-Au12600	NCP	%	94			70-130	Pass	
TRH C6-C10	W20-Au12600	NCP	%	75			70-130	Pass	
TRH >C10-C16	W20-Au12605	NCP	%	75			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S20-Au07169	NCP	%	89			70-130	Pass	
Acenaphthylene	S20-Au07169	NCP	%	98			70-130	Pass	
Anthracene	S20-Au07169	NCP	%	85			70-130	Pass	
Benz(a)anthracene	S20-Au08000	NCP	%	87			70-130	Pass	
Benzo(a)pyrene	S20-Au07169	NCP	%	77			70-130	Pass	
Benzo(b&j)fluoranthene	S20-Au07169	NCP	%	81			70-130	Pass	
Benzo(g.h.i)perylene	S20-Au07169	NCP	%	80			70-130	Pass	
Benzo(k)fluoranthene	S20-Au07169	NCP	%	92			70-130	Pass	
Chrysene	S20-Au07169	NCP	%	84			70-130	Pass	
Dibenz(a.h)anthracene	S20-Au08000	NCP	%	77			70-130	Pass	
Fluoranthene	S20-Au07169	NCP	%	101			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Fluorene	S20-Au07169	NCP	%	88			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S20-Au07169	NCP	%	73			70-130	Pass	
Naphthalene	S20-Au07169	NCP	%	98			70-130	Pass	
Phenanthrene	S20-Au07169	NCP	%	91			70-130	Pass	
Pyrene	S20-Au07169	NCP	%	96			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S20-Au11993	NCP	%	97			75-125	Pass	
Cadmium	S20-Au11993	NCP	%	99			75-125	Pass	
Chromium	S20-Au11993	NCP	%	115			75-125	Pass	
Copper	S20-Au11993	NCP	%	101			75-125	Pass	
Lead	S20-Au11993	NCP	%	93			75-125	Pass	
Mercury	S20-Au11993	NCP	%	113			75-125	Pass	
Nickel	S20-Au11993	NCP	%	99			75-125	Pass	
Zinc	S20-Au11433	NCP	%	101			75-125	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S20-Au14431	NCP	%	72			70-130	Pass	
a-BHC	S20-Au14431	NCP	%	76			70-130	Pass	
Dieldrin	S20-Au14431	NCP	%	81			70-130	Pass	
Endosulfan I	S20-Au14431	NCP	%	73			70-130	Pass	
Endrin	S20-Au14431	NCP	%	70			70-130	Pass	
Heptachlor	S20-Au14431	NCP	%	86			70-130	Pass	
Hexachlorobenzene	S20-Au14431	NCP	%	82			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	S20-Au14431	NCP	%	72			70-130	Pass	
Ethion	S20-Au14431	NCP	%	102			70-130	Pass	
Fenitrothion	S20-Au14431	NCP	%	130			70-130	Pass	
Mevinphos	S20-Au14431	NCP	%	71			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDD	S20-Au17953	NCP	%	93			70-130	Pass	
4.4'-DDE	S20-Au09816	NCP	%	72			70-130	Pass	
4.4'-DDT	S20-Au17953	NCP	%	87			70-130	Pass	
Aldrin	S20-Au09816	NCP	%	71			70-130	Pass	
b-BHC	S20-Au17953	NCP	%	95			70-130	Pass	
d-BHC	S20-Au17953	NCP	%	100			70-130	Pass	
Endosulfan II	S20-Au09816	NCP	%	71			70-130	Pass	
Endosulfan sulphate	S20-Au17953	NCP	%	91			70-130	Pass	
Endrin aldehyde	S20-Au09816	NCP	%	82			70-130	Pass	
Endrin ketone	S20-Au17953	NCP	%	91			70-130	Pass	
g-BHC (Lindane)	S20-Au17953	NCP	%	96			70-130	Pass	
Heptachlor epoxide	S20-Au17953	NCP	%	91			70-130	Pass	
Methoxychlor	S20-Au17953	NCP	%	79			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Dimethoate	S20-Au07910	NCP	%	101			70-130	Pass	
Methyl parathion	S20-Au07910	NCP	%	107			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	S20-Au11007	NCP	mg/kg	7.6	3.3	79	30%	Fail	Q15
Cadmium	S20-Au11007	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-Au11007	NCP	mg/kg	21	17	23	30%	Pass	
Copper	S20-Au11007	NCP	mg/kg	53	55	4.0	30%	Pass	
Lead	S20-Au11007	NCP	mg/kg	15	14	12	30%	Pass	
Mercury	S20-Au11007	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S20-Au11007	NCP	mg/kg	7.4	7.2	4.0	30%	Pass	
Zinc	S20-Au11007	NCP	mg/kg	34	37	8.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S20-Au11432	NCP	%	10	9.3	11	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S20-Au11644	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S20-Au11644	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S20-Au11644	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S20-Au11644	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S20-Au11644	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S20-Au11644	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S20-Au11644	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S20-Au11644	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S20-Au11644	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S20-Au11644	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S20-Au11644	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S20-Au11644	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S20-Au11644	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S20-Au11644	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S20-Au11644	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S20-Au11644	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S20-Au11644	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S20-Au11644	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S20-Au11644	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S20-Au11644	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S20-Au11644	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S20-Au11644	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S20-Au11645	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S20-Au11645	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S20-Au11645	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S20-Au11645	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S20-Au11645	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S20-Au11645	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S20-Au11645	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S20-Au11645	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S20-Au11645	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S20-Au11219	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S20-Au11219	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S20-Au11219	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S20-Au11219	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S20-Au11219	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S20-Au11219	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S20-Au11219	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S20-Au11219	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S20-Au11219	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S20-Au11219	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S20-Au11219	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S20-Au11219	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S20-Au11219	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S20-Au11219	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S20-Au11219	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S20-Au11219	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S20-Au11219	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S20-Au11219	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S20-Au11219	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	S20-Au11219	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	S20-Au11219	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	S20-Au11219	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	

Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Pyrazophos	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	S20-Au11219	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Toxaphene	S20-Au17952	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S20-Au11652	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S20-Au11652	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S20-Au11652	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S20-Au11652	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S20-Au11652	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S20-Au11652	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S20-Au11652	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S20-Au11652	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S20-Au11652	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S20-Au11652	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S20-Au11652	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S20-Au11652	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S20-Au11652	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S20-Au11652	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S20-Au11652	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S20-Au11652	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S20-Au11652	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S20-Au11652	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S20-Au11652	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S20-Au11652	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S20-Au11652	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S20-Au11652	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

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 Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Alena Bounkeua	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)

Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

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

CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing ABN 50 005 085 521

☑ **Sydney Laboratory** Unit F3 Bld.F 16 Mars Road Lane Cove West NSW 2066 02 9900 8400 EnviroSampleNSW@eurofins.com

☐ **Brisbane Laboratory** Unit 1 21 Smallwood Place Murarrie QLD 4172 07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory** Unit 2 91 Leach Highway Kewdale WA 6105 08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory** 6 Monterey Road Dandenong South VIC 3175 03 8564 5000 EnviroSampleVic@eurofins.com

Company	Metech Consulting	Project №	EP147	Project Manager	Michelle Battam
Address	Level 1, 29 Kiora Road Miranda, NSW 2228	Project Name	Brookvale (Mitchell Rd)	EDD Format ESdat, EQuIS etc	-
Contact Name	Mel Moyce				
Phone №	0424 394 490				
Special Directions	-				
Purchase Order	-				
Quote ID №	-				

Sampler(s)	Melissa Moyce	
Handed over by	Melissa Moyce	
Email for Invoice	admin@metech-consult.com	
Email for Results	mmoyce@metech.consulting ; mbattam@metech.consulting	

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	B1: TRH and BTEXN	B7: TRH, BTEXN, PAH, Metals (8)	B10: TRH, BTEXN, PAH, OCP, OPP, Metals (8)	B14 : OCP, OPP	B4: TRH, BTEXN, PAH	Containers: 500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	MW1/0.6	6/08/20	S		X										1		
2	MW1/1.0	6/08/20	S												1		
3	MW1/2.0	6/08/20	S					X							1		
4	MW1/2.7	6/08/20	S												1		
5	MW1/3.5	6/08/20	S												1		
6	MW1/4.0	6/08/20	S												1		
7	MW2/1.0	6/08/20	S		X										1		
8	MW2/2.0	6/08/20	S												1		
9	MW2/3.0	6/08/20	S					X							1		
10	MW2/3.9	6/08/20	S												1		
	Total Counts				2			2							10		

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

♦Surcharge will apply

- ☐ Overnight (reporting by 9am)♦
- ☐ Same day ◆ ☐ 1 day ◆
- ☐ 2 days ◆ ☐ 3
- ☑ 5 days (Standard)
- ☐ Other( )

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal

Name | Signature | Date | Time

Laboratory Use Only

Received By	Grace Tucker	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	7/8	Time	5:41
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time	

Temperature: 7.37

Report №: 736726

Eurofins Environment Testing Australia Pty Ltd

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | Environment Testing Standard Terms and Conditions unless agreed otherwise. A copy is available on request.

CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing ABN 50 005 085 521

☑ **Sydney Laboratory**
Unit F3 Bld.F 16 Mars Road Lane Cove West NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☐ **Brisbane Laboratory**
Unit 1 21 Smallwood Place Murarrie QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory**
Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Metech Consulting	Project №	EP147	Project Manager	Michelle Battam
Address	Level 1, 29 Kiora Road Miranda, NSW 2228	Project Name	Brookvale (Mitchell Rd)	EDD Format ESdat, EQuIS etc	-
Contact Name	Mel Moyce				
Phone №	0424 394 490				
Special Directions	-				
Purchase Order	-				
Quote ID №	-				

Sampler(s)	Melissa Moyce
Handed over by	Melissa Moyce
Email for Invoice	admin@metech-consult.com
Email for Results	mmoyce@metech.consulting ; mbattam@metech.consulting

Analyses
Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	B1: TRH and BTEXN	B7: TRH, BTEXN, PAH, Metals (8)	B10: TRH, BTEXN, PAH, OCP, OPP, Metals (8)	B14: OCP, OPP	B4: TRH, BTEXN, PAH	Containers: 500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
11	MW2/5.0	6/08/20	S												1		
12	BH1A/0.5	6/08/20	S				X								1		
13	BH1A/1.0	6/08/20	S		X										1		
14	BH1A/2.0	6/08/20	S												1		
15	BH1A/3.0	6/08/20	S					X							1		
16	BH1A/3.9	6/08/20	S												1		
17	BH1A/3.9	6/08/20	S												1		
18	BH1A/4.5	6/08/20	S												1		
19	BH1A/5.4	6/08/20	S												1		
20	BH2/0.9	6/08/20	S		X										1		
	Total Counts				2		1	1							10		

Containers — Change container type & size if necessary

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

♦Surcharge will apply
- ☐ Overnight (reporting by 9am)♦
- ☐ Same day ♦ ☐ 1 day ♦
- ☐ 2 days ♦ ☐ 3
- ☑ 5 days (Standard)
- ☐ Other( )

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☐ Postal	Name		Signature		Date		Time	
Laboratory Use Only	Received By	Grace Tuckey	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	7/8	Time	5:41	Temperature	7.37
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report №	736726

CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing ABN 50 005 085 521

☑ **Sydney Laboratory**
Unit F3 Bld.F 16 Mars Road Lane Cove West NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

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Unit 1 21 Smallwood Place Murarrie QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory**
Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Metech Consulting	Project №	EP147	Project Manager	Michelle Battam
Address	Level 1, 29 Kiora Road Miranda, NSW 2228	Project Name	Brookvale (Mitchell Rd)	EDD Format ESdat, EQuIS etc	-
Contact Name	Mel Moyce				
Phone №	0424 394 490				
Special Directions	-				
Purchase Order	-				
Quote ID №	-				

Sampler(s)	Melissa Moyce
Handed over by	Melissa Moyce
Email for Invoice	admin@metech-consult.com
Email for Results	mmoyce@metech.consulting ; mbattam@metech.consulting

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	B1: TRH and BTEXN	B7: TRH, BTEXN, PAH, Metals (8)	B10: TRH, BTEXN, PAH, OCP, OPP, Metals (8)	B14 : OCP, OPP	B4: TRH, BTEXN, PAH
21	BH2/1.5	6/08/20	S					
22	BH2/1.9	6/08/20	S					
23	BH2A/2.5	6/08/20	S					
24	BH2A/3.0	6/08/20	S					X
25	BH2A/4.0	6/08/20	S					
26	BH2A/5.5	6/08/20	S					
27	BH2A/6.0	6/08/20	S					
28	BH3/0.5	7/8/20	S			X		
29	BH3/1.0	7/8/20	S					
30	QA1	6/08/20	S					X
	Total Counts					1		2

Containers — Change container type & size if necessary.

№	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
21							1		
22							1		
23							1		
24							1		
25							1		
26							1		
27							1		
28							1		
29							1		
30							1		
							10		

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

♦Surcharge will apply

- ☐ Overnight (reporting by 9am)♦
- ☐ Same day ♦ ☐ 1 day ♦
- ☐ 2 days ♦ ☐ 3
- ☑ 5 days (Standard)
- ☐ Other( )

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☐ Postal	Name		Signature		Date		Time	
Laboratory Use Only	Received By	Grace Tuckwell	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	7/8	Time	5:41	Temperature	7.37
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report №	736726

Eurofins Environment Testing Australia Pty Ltd

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CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing ABN 50 005 085 521

☑ **Sydney Laboratory**
Unit F3 Bld.F 16 Mars Road Lane Cove West NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☐ **Brisbane Laboratory**
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07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory**
Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Metech Consulting	Project №	EP147	Project Manager	Michelle Battam
Address	Level 1, 29 Kiora Road Miranda, NSW 2228	Project Name	Brookvale (Mitchell Rd)	EDD Format ESdat, EQuIS etc	-
Contact Name	Mel Moyce				
Phone №	0424 394 490				
Special Directions	-				
Purchase Order	-				
Quote ID №	-				

Sampler(s)	Melissa Moyce	
Handed over by	Melissa Moyce	
Email for Invoice	admin@metech-consult.com	
Email for Results	mmoyce@metech.consulting ; mbattam@metech.consulting	

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	B1: TRH and BTEXN	B7: TRH, BTEXN, PAH, Metals (8)	B10: TRH, BTEXN, PAH, OCP, OPP, Metals (8)	B14: OCP, OPP	Hold	Containers: 500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
21	QA2	6/08/20	S					✖							1		
22																	
23																	
24																	
25																	
26																	
27																	
28																	
29																	
30																	
	Total Counts							1							1		

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

♦Surcharge will apply

- ☐ Overnight (reporting by 9am)♦
- ☐ Same day ♦ ☐ 1 day ♦
- ☐ 2 days ♦ ☐ 3
- ☑ 5 days (Standard)
- ☐ Other( )

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal

Name | Signature | Date | Time

Laboratory Use Only

Received By	Grace Tuckey	SYD / BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	7/8	Time	5:41	Temperature 7.37
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report № 736726

Eurofins Environment Testing Australia Pty Ltd

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eurofins | Environment Testing

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

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

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

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

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**Metech Consulting Pty Ltd**
Contact name:	Melissa Moyce
Project name:	BROOKVALE
Project ID:	EP147
Turnaround time:	Overnight
Date/Time received:	Aug 11, 2020 4:11 PM
Eurofins reference:	**737123**

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 your Analytical Sales Manager:

Alena Bounkeua on Phone : or by email: AlenaBounkeua@eurofins.com

Results will be delivered electronically via email to Melissa Moyce - mmoyce@metech.consulting.

Note: A copy of these results will also be delivered to the general Metech Consulting Pty Ltd email address.

eurofins | Environment Testing

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

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
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Site # 1254 & 14271

Sydney
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Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

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

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

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

New Zealand

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

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

Company Name: Metech Consulting Pty Ltd
Address: PO Box 1184
Sutherland
NSW 1499

Project Name: BROOKVALE
Project ID: EP147

Order No.:
Report #: 737123
Phone: (02)9575 7755
Fax:

Received: Aug 11, 2020 4:11 PM
Due: Aug 12, 2020
Priority: Overnight
Contact Name: Melissa Moyce

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Eurofins Suite B7 (filtered metals)
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						X
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						
Newcastle Laboratory						
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	MW1	Aug 11, 2020		Water	S20-Au15479	X
2	MW2	Aug 11, 2020		Water	S20-Au15480	X
3	QA3	Aug 11, 2020		Water	S20-Au15481	X
Test Counts						3

Metech Consulting Pty Ltd
PO Box 1184
Sutherland
NSW 1499

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: **Melissa Moyce**

Report **737123-W**
Project name BROOKVALE
Project ID EP147
Received Date Aug 11, 2020

Client Sample ID			**MW1**	**MW2**	**QA3**
Sample Matrix			**Water**	**Water**	**Water**
Eurofins Sample No.			**S20-Au15479**	**S20-Au15480**	**S20-Au15481**
Date Sampled			**Aug 11, 2020**	**Aug 11, 2020**	**Aug 11, 2020**
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1
BTEX					
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	123	121	116
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1
Polycyclic Aromatic Hydrocarbons					
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001	< 0.001	< 0.001
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001

Client Sample ID			MW1	MW2	QA3
Sample Matrix			Water	Water	Water
Eurofins Sample No.			S20-Au15479	S20-Au15480	S20-Au15481
Date Sampled			Aug 11, 2020	Aug 11, 2020	Aug 11, 2020
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	INT	INT	INT
p-Terphenyl-d14 (surr.)	1	%	121	137	125
Heavy Metals					
Arsenic (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	< 0.001	0.008	0.005
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001
Nickel (filtered)	0.001	mg/L	< 0.001	0.002	< 0.001
Zinc (filtered)	0.005	mg/L	< 0.005	0.19	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.

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	Aug 11, 2020	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Aug 11, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Aug 11, 2020	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Aug 11, 2020	
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Aug 11, 2020	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8 filtered	Sydney	Aug 11, 2020	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

eurofins | Environment Testing

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Sutherland
NSW 1499

Project Name: BROOKVALE
Project ID: EP147

Order No.:
Report #: 737123
Phone: (02)9575 7755
Fax:

Received: Aug 11, 2020 4:11 PM
Due: Aug 12, 2020
Priority: Overnight
Contact Name: Melissa Moyce

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Eurofins Suite B7 (filtered metals)
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						X
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						
Newcastle Laboratory						
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	MW1	Aug 11, 2020		Water	S20-Au15479	X
2	MW2	Aug 11, 2020		Water	S20-Au15480	X
3	QA3	Aug 11, 2020		Water	S20-Au15481	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 follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/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							
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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH C10-C14	%	107			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	101			70-130	Pass	
Toluene	%	94			70-130	Pass	
Ethylbenzene	%	92			70-130	Pass	
m&p-Xylenes	%	94			70-130	Pass	
o-Xylene	%	96			70-130	Pass	
Xylenes - Total*	%	95			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	83			70-130	Pass	
TRH C6-C10	%	87			70-130	Pass	
TRH >C10-C16	%	94			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	87			70-130	Pass	
Acenaphthylene	%	101			70-130	Pass	
Anthracene	%	110			70-130	Pass	
Benz(a)anthracene	%	119			70-130	Pass	
Benzo(a)pyrene	%	96			70-130	Pass	
Benzo(b&j)fluoranthene	%	116			70-130	Pass	
Benzo(g.h.i)perylene	%	103			70-130	Pass	
Benzo(k)fluoranthene	%	108			70-130	Pass	
Chrysene	%	101			70-130	Pass	
Dibenz(a.h)anthracene	%	113			70-130	Pass	
Fluoranthene	%	108			70-130	Pass	
Fluorene	%	103			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	94			70-130	Pass	
Naphthalene	%	83			70-130	Pass	
Phenanthrene	%	107			70-130	Pass	
Pyrene	%	111			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic (filtered)	%	105			80-120	Pass	
Cadmium (filtered)	%	103			80-120	Pass	
Chromium (filtered)	%	106			80-120	Pass	
Copper (filtered)	%	107			80-120	Pass	
Lead (filtered)	%	102			80-120	Pass	
Mercury (filtered)	%	109			80-120	Pass	
Nickel (filtered)	%	109			80-120	Pass	
Zinc (filtered)	%	107			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	S20-Au06600	NCP	%	108			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S20-Au06600	NCP	%	94			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	S20-Au15481	CP	%	91			75-125	Pass	
Cadmium (filtered)	S20-Au15481	CP	%	86			75-125	Pass	
Chromium (filtered)	S20-Au15481	CP	%	90			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Copper (filtered)	S20-Au15481	CP	%	90			75-125	Pass	
Lead (filtered)	S20-Au15481	CP	%	87			75-125	Pass	
Mercury (filtered)	S20-Au15481	CP	%	90			75-125	Pass	
Nickel (filtered)	S20-Au15481	CP	%	92			75-125	Pass	
Zinc (filtered)	S20-Au15481	CP	%	91			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	S20-Au10057	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	S20-Au06610	NCP	mg/L	20	21	5.0	30%	Pass	
TRH C15-C28	S20-Au06610	NCP	mg/L	11	11	6.0	30%	Pass	
TRH C29-C36	S20-Au06610	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S20-Au10057	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S20-Au10057	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S20-Au10057	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S20-Au10057	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S20-Au10057	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	S20-Au10057	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S20-Au10057	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	S20-Au10057	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH >C10-C16	S20-Au06610	NCP	mg/L	21	22	5.0	30%	Pass	
TRH >C16-C34	S20-Au06610	NCP	mg/L	3.8	4.0	5.0	30%	Pass	
TRH >C34-C40	S20-Au06610	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	S20-Au15479	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium (filtered)	S20-Au15479	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	S20-Au15479	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	S20-Au15479	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead (filtered)	S20-Au15479	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury (filtered)	S20-Au15479	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	S20-Au15479	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc (filtered)	S20-Au15479	CP	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

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

Alena Bounkeua	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)

Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

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

CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing ABN 50 005 085 521

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Contact Name	Mel Moyce
Phone №	0424 394 490
Special Directions	-
Purchase Order	-
Quote ID №	-
Project №	EP147
Project Name	Brookvale
Project Manager	
EDD Format (ESdat, EQuIS etc)	
Sampler(s)	Mel Moyce
Handed over by	Mel Moyce
Email for Invoice	admin@metech-consult.com
Email for Results	mmoyce@metech.consulting ; mbattam@metech.consulting

Analyses: Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers: Change container type & size if necessary.

Required Turnaround Time (TAT): Default will be 5 days if not ticked. ◆Surcharge will apply

- ☐ Overnight (reporting by 9am)◆
- ☑ Same day ◆
- ☐ 1 day ◆
- ☐ 2 days ◆
- ☐ 3
- ☐ 5 days (Standard)
- ☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7: TRH / BTEXN / Metals / PAHs														500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	MW1	11/08/20	W	X																	1	2				
2	MW2	11/8/20	W	X																	1	2				
3	QA3	11/8/20	W	X																	1	2				
4																										
5																										
6																										
7																										
8																										
9																										
10																										
	Total Counts			3																	3	6				

Method of Shipment: ☐ Courier (#) ☑ Hand Delivered ☐ Postal | Name: Mel Moyce | Signature: [signature] | Date: 11/08/2020 | Time: 2:00:00 PM

Laboratory Use Only										
Received By	Grace Tucker	(SYD) | BNE | MEL | PER | ADL | NTL | DRW	Signature	[signature]	Date	11/8	Time	4:11	Temperature	10.53
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report №	737123

Eurofins Environment Testing Australia Pty Ltd

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | Environment Testing Standard Terms and Conditions unless agreed otherwise. A copy is available on request.

QS3009_R10 Modified by: Dr. R Symons Approved by: G. Jackson Approved on: 8 August 2019