

Additional Environmental Site Assessment

Australian Rail Track Corporation

Goulburn Roundhouse
12 Braidwood Road
Goulburn, NSW 2580

August 2021

Ref. 20025.76 R03



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Report Details**Report:**

Additional Environmental Site Assessment

Goulburn Roundhouse
12 Braidwood Road, Goulburn
New South Wales 2580

Ref: 20025.76 R03

for

Australian Rail Track Corporation Limited

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Executive summary

Cavvanba Consulting Pty Ltd was commissioned by Australian Rail Track Corporation Limited (ARTC) to undertake an additional environmental site assessment at the Goulburn Roundhouse, located at 12 Braidwood Road, Goulburn, New South Wales 2580 (herein referred to as the site). The site is currently used as a railway museum and actively operated as a Roundhouse by the Goulburn Locomotive Roundhouse Preservation Society Incorporated for storage, restoration and maintenance of locomotives and rolling stock.

This Additional ESA has been completed following a Detailed Site Investigation completed by Cavvanba, and in accordance with Sampling and Analysis Quality Plan – Additional Environmental Site Assessment, Goulburn Roundhouse, 12 Braidwood Road, Goulburn NSW 2580 2663 (Cavvanba, 2021b) (referred to herein as 'SAQP').

The objectives of the investigation were to supplement previous investigation data and further understand and delineate the extent of contamination at the site, provide an additional assessment on whether the contamination presents an unacceptable risk to human health and/or the environment on and off-site, and provide further information to assist the NSW EPA in their decision making on whether the site requires regulation under the Contaminated Land Management Act 1997.

To meet the project objectives, the scope of work included the investigation of soil and groundwater at the site which has been completed as individual components in accordance with the SAQP.

Component 1 – TRH in groundwater

- There was no evidence of gross petroleum hydrocarbon contamination observed within soil during the delineation of the previously identified dissolved phase petroleum hydrocarbon impacts in groundwater within the vicinity of the former diesel refuelling gantry.*
- Dissolved phase petroleum hydrocarbon contamination in groundwater in monitoring well MW02, located adjacent to the former refuelling gantry was reported two orders of magnitude below the previous groundwater monitoring event. Trihalomethanes, including chloroform and bromodichloromethane were also detected in groundwater at concentrations above the laboratory limit of reporting. The presence of these constituents is likely an indication of a potential potable water source / influence at this location.*
- Petroleum hydrocarbon concentrations in monitoring well MW02, are limited in extent, having been delineated by a reduction in dissolved phase concentrations to the north, and absence of detectable petroleum hydrocarbon concentrations in existing and newly installed monitoring located down and cross-hydraulic gradient. However, some uncertainty remains regarding the two orders of magnitude reduction in contaminant concentrations and presence of trihalomethanes in groundwater.*

Component 2 – Site infilling and waste disposal

- Lead was reported to exceed the health investigation level of 1,500 mg/kg at one location as part of this additional investigation. The lead exceedance was identified in fill material within the filled area located adjacent to the former workshop / machine shop in the southern portion of the site.*
- Lead concentrations in soil were reported below the adopted health investigation level in all other samples collected from surficial soils and fill material collected as part of this investigation.*

- *Asbestos containing material was identified in one test pitting location as part of this additional investigation. Non-friable asbestos containing material was present within fill material from a depth of 1.7 m within the filled area adjacent to the former workshop / machine shop in the southern portion of the site.*
- *Potential asbestos containing material fragments were not identified within any other test pitting locations advanced as part of this investigation.*

Component 3 – Groundwater monitoring

- *The nature and extent of groundwater contamination at the site is summarised below:*
 - *evidence of LNAPL was not observed;*
 - *groundwater analytical concentrations were reported below the applicable CRC CARE HSLs for vapour intrusion; and*
 - *dissolved phase petroleum hydrocarbon impacts are limited in extent, having been delineated by monitoring wells on-site.*

Through the development and continual refinement of the conceptual site model, potentially complete source-pathway-receptor linkages resulting in a potential risk to human health receptors under a commercial/industrial land use scenario have been identified which require further monitoring, remediation and/or appropriate management. These are discussed in Table 1, below.

Table 1: Data gaps summation and recommendations

<i>Data Gaps summation</i>	<i>Recommendation</i>
<p><i>1) TRH in groundwater</i></p> <p><i>The varying magnitude and trends of TRH in groundwater within the vicinity of the former diesel refuelling gantry and the Roundhouse where active maintenance is occurring are not well understood. There is some additional uncertainty regarding the two orders of magnitude reduction in dissolved phase petroleum hydrocarbons and presence of trihalomethanes in groundwater within monitoring well MW02. Furthermore, there is some uncertainty regarding on-site waste management procedures and the integrity of the subterranean waste oil network.</i></p>	<p><i>Completion of a review of on-site waste management procedures and/or confirm the integrity of the subterranean waste oil network. Continue with a program of routine groundwater monitoring to:</i></p> <ul style="list-style-type: none"> – <i>ensure that any changes in contaminant concentrations can be detected;</i> – <i>demonstrate plume stability, or otherwise; and</i> – <i>ensure the appropriate protection of groundwater human and ecological health.</i>
<p><i>2) Site infilling and waste disposal areas</i></p> <p><i>The nature and extent of buried waste material within the eastern and southern portion of the site has been established, sufficient to facilitate future remediation and/or management options for this area.</i></p>	<p><i>Development of remediation and/or management options to ensure the protection of human and ecological health.</i></p>
<p><i>3) Asbestos in and on soil</i></p> <p><i>The nature and extent of ACM in and on soil has been established. There is sufficient information to facilitate future remediation and/or management options for ACM on-site.</i></p>	<p><i>Implement interim management measures as per Interim Management Plan (Cavvanba, 2021c), and development of remediation and/or management options to ensure the appropriate protection of human health.</i></p>

<p><i>4) Site history</i></p> <p><i>The site has a long and complicated history with over 100 years of heavy industrial activity, and a change in site operations and management from approximately 1989 when the GLRPS acquired the lease. Some additional information has been obtained as part of this investigation.</i></p>	<p><i>It is envisaged that this data gap will be progressively reconciled through the completion of additional monitoring and/or development of remediation / management options.</i></p>
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1.0 Introduction

Cavvanba Consulting Pty Ltd (Cavvanba) was commissioned by Australian Rail Track Corporation Limited (ARTC) to undertake an Additional Environmental Site Assessment (ESA) at the Goulburn Roundhouse, located at 12 Braidwood Road, Goulburn, New South Wales (NSW) 2580 (herein referred to as the site). The site location is presented on Figure 1.

The scope of work and methodology was consistent with that detailed within Cavvanba's letter proposal titled '*Additional Environmental Site Assessment – Goulburn Roundhouse, 12 Braidwood Road, Goulburn NSW 2580*' submitted to ARTC on 22 February 2021 (Cavvanba Ref: P20025.76). This report should be read in its entirety, with specific reference to Cavvanba's *General Limitations*, included as Section 1.5.

1.1 Background

The site is currently used as a railway museum and actively operated as a Roundhouse by the Goulburn Locomotive Roundhouse Preservation Society Incorporated (GLRPS) for storage, restoration and maintenance of locomotives and rolling stock.

This Additional ESA has been completed following *Detailed Site Investigation – Goulburn Roundhouse, 12 Braidwood Road, Goulburn NSW 2580* (Ref: 20025.76 R01) (Cavvanba, January 2021a), and in accordance with *Sampling and Analysis Quality Plan – Additional Environmental Site Assessment, Goulburn Roundhouse, 12 Braidwood Road, Goulburn NSW 2580 2663* (Ref: 20025.76 R02) (Cavvanba, April 2021b) (referred to herein as the SAQP).

Through the conceptual site model developed as part of the DSI, potentially complete source-pathway-receptor linkages resulting in a potential risk to human health under a commercial/industrial land use scenario were identified which required further assessment. These data gaps and recommendations have been summarised below in Table 1.1, and are the focus of this investigation.

Table 1.1: Data gaps and recommendations

Data Gap	Recommendation
1) Total recoverable hydrocarbons (TRH) in groundwater	Further assess the presence and significance of TRH in groundwater and commencement of a program of routine groundwater monitoring. This should also incorporate the confirmation of the integrity of the subterranean waste oil network and drainage system.
2) Site infilling and waste disposal areas	Implement interim management measures. Determine the nature and extent of waste material, including the presence of lead in fill material across the site.
3) Asbestos in and on soil	Implement interim management measures, develop and implement an asbestos management plan to manage asbestos in and on soil. Determine the nature and extent of asbestos in soil to enable appropriate management / remediation.
4) Site history	Where practicable, further understand historical site features and operations to determine whether further investigation within these areas is considered warranted.

1.1.1 Interim management plan

An *Interim Management Plan – Goulburn Roundhouse* (Cavvanba, 2020) was prepared by Cavvanba in September 2020 to ensure that all practicable steps were taken to minimise the potential risk of exposure to potential asbestos containing material and lead contamination at the site prior to the outcome of the detailed site investigation.

This was updated in April 2021 based on information from the outcome of the DSI, which provided additional certainty to specific areas of the site. It is to remain in place until there is a sufficient understanding of the nature and extent of contamination and a remediation strategy has been implemented.

1.1.2 Regulatory status

The site was notified to the NSW EPA under the duty to report obligations, Section 60 of the *Contaminated Land Management Act 1997* (CLM Act) (as amended in 2008). The site is on the list of notified sites and is being assessed by the EPA to determine whether regulation under the CLM Act is required.

1.2 Previous environmental investigations

The site has been subject to a series of soil and groundwater management activity since 1996. The following investigations / plans were made available to Cavvanba for review:

- *Phase 1 Environmental Contamination Assessment – SR50 Goulburn* (CMPS&F Pty Ltd, 1996);
- *Environmental Investigation – Goulburn Fuelling Facility at Braidwood Rd* (Jeffrey and Katauskas Pty Ltd, 1997);
- *Decommissioning/Decontamination Strategy for Goulburn Railyard* (Dames and Moore Pty Ltd, 1997);
- *Environmental Management Plan – The Goulburn Roundhouse Complex* (Goulburn Loco Roundhouse Preservation Society Incorporated, 2006);
- *Preliminary Contamination Investigation – Goulburn Roundhouse Railway Track* (DM McMahon Pty Ltd, 2014);
- *Interim Management Plan – Goulburn Roundhouse* (Cavvanba, 2020c);
- *Detailed Site Investigation – Goulburn Roundhouse, 12 Braidwood Road, Goulburn NSW 2580* (Cavvanba, January 2021a);
- *Sampling and Analysis Quality Plan – Goulburn Roundhouse, 12 Braidwood Road, Goulburn NSW 2580* (Cavvanba, April 2021b); and
- *Interim Management Plan – Goulburn Roundhouse* (Cavvanba, 2021d).

1.3 Objective

The objectives of the Additional ESA were to:

- supplement previous investigation data and further understand and delineate the extent of contamination associated with the data gaps presented in Table 1.1;
- provide an additional assessment on whether the contamination presents an unacceptable risk to human health and/or the environment on and off-site; and
- provide further information to assist the NSW EPA in their decision making on whether the site requires regulation under the CLM Act.

1.4 Scope of work

To achieve the objectives outlined above, the following scope of work was undertaken in accordance with the SAQP, and based on the requirements outlined in the following guidelines:

- NSW EPA (2020) *Consultants Reporting on Contaminated Land*;
- NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd edition)*; and

- *National Environment Protection Council (NEPC) National Environment Protection (Assessment of Site Contamination) Measure 1999 (ASC NEPM (2013)) – Schedule B2: Guideline on Site Characterisation (2013).*

A site walkover and visual inspection was completed for review of key features within areas of environmental concern, and to provide for any necessary improvements in the investigation design.

The scope of the three investigation components included the following activities:

Component 1 – TRH in groundwater

- Advancement of five boreholes to maximums depth of 9 metres (m) using a combination of hand augering and mechanical drilling techniques.
- Conversion of boreholes to groundwater monitoring wells followed by development and purging to enable the collection of groundwater samples.

Component 2 – Site infilling and waste disposal areas

- Advancement of 30 test pits using an excavator to a maximum depth of 2.5 m.
- Collection and submission of soil samples to a NATA accredited laboratory for analysis of contaminants of concern (COCs).

Component 3 – Groundwater monitoring

- Gauging and sampling of all newly installed and existing groundwater monitoring wells using low flow sampling techniques.
- Submission of groundwater samples to a NATA accredited laboratory for analysis of COCs.
- Survey of newly installed groundwater monitoring wells to metres Australian Height Datum (AHD) and eastings and northings by a registered surveyor.

1.5 Limitations

The findings of this report are based on the objectives and scope of work outlined above. Cavvanba performed the services in a manner consistent with the normal level of care and expertise exercised by members of the environmental assessment profession. No warranties or guarantees, express or implied, are made. Subject to the scope of work, Cavvanba's assessment is limited strictly to identifying typical environmental conditions associated with the subject property, and does not include evaluation of any other issues. This report does not comment on any regulatory obligations based on the findings, for which a legal opinion should be sought. This report relates only to the objectives and scope of work stated, and does not relate to any other works undertaken for the Client.

The report and conclusions are based on the information obtained at the time of the assessment. Changes to the subsurface conditions may occur subsequent to the investigation described herein, through natural processes or through the intentional or accidental addition of contaminants, and these conditions may change with space and time.

The site history, and associated uses, areas of use, and potential contaminants, were determined based on the activities described in the scope of work. Additional site history information held by the Client, regulatory authorities, or in the public domain, which was not provided to Cavvanba or was not sourced by Cavvanba under the scope of work, may

identify additional uses, areas of use and/or potential contaminants. The information sources referenced have been used to determine site history and desktop information regarding local subsurface conditions. While Cavvanba has used reasonable care to avoid reliance on data and information that is inaccurate or unsuitable, Cavvanba is not able to verify the accuracy or completeness of all information and data made available.

Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history, and which may not be expected at the site. The absence of any identified hazardous or toxic materials on the subject property, should not be interpreted as a warranty or guarantee that such materials do not exist on the site. If additional certainty is required, additional site history or desktop studies, or environmental sampling and analysis, should be commissioned.

The results of this assessment are based upon site inspection and fieldwork conducted by Cavvanba personnel and information provided by the Client. All conclusions regarding the property area are the professional opinions of the Cavvanba personnel involved with the project, subject to the qualifications made above. While normal assessments of data reliability have been made, Cavvanba assumes no responsibility or liability for errors in any data obtained from regulatory agencies, information from sources outside of Cavvanba, or developments resulting from situations outside the scope of this project.

2.0 Site setting

2.1 Site identification and description

The site consists of a single lot, identified as Lot 2 in Deposited Plan (DP) 1002813. The total site area is 46,390 m² and is located to the south of the Goulburn central business district, and immediately adjacent to the east of the Main South Railway line.

Access to the site is from Braidwood Road via a sealed asphalt access road in the central portion of the site and the remainder is otherwise unsealed gravel access roads, railway lines or fill material comprising coal and ash. Grass cover is present within the southern and eastern portion with sporadic vegetation and larger trees within isolated areas of the site. A chain link fence prevents unrestricted access to the site from Braidwood Road, however there is a portion in the southeast of the site where the fence line intersects, and does not align with the site boundary. As a result, the south-eastern portion is accessible to the public. The site layout has been presented on Figure 2.

The site identification and land use details are provided below.

Site Owner:	Transport for New South Wales (TfNSW)
Site Manager:	ARTC
Lessee	GLRPS
Site Address:	12 Braidwood Road, Goulburn NSW 2580
Legal Property Description:	Lot 2 in DP 1002813
Property area:	Approximately 46,390 m ²
Co-ordinates:	Latitude: -34.773891 Longitude: 149.710899
Local Government Authority:	Goulburn – Mulwaree Council.
Elevation:	Approximately 638 metres (m) Australian Height Datum (AHD).
Landuse – Proposed:	Commercial / Industrial
Zoning:	IN1 – General Industrial

2.2 Surrounding land use

Land use features surrounding the site are summarised below:

North:	The railway corridor extends to the north of the site. Immediately north is the CFCL Australia Rail Services maintenance facility, located within the railway corridor. It is understood that this facility is used for the overhaul, maintenance, modification and painting of locomotives and rolling stock. A number of commercial properties, including an automotive wreckers and engineering depot are located beyond the CFCL site,
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followed by residential properties.

East: Braidwood Road borders the site to the east followed by a rural residential property and agricultural land.

The Mulwaree River is located approximately 570 metres from the site boundary.

South: The Hume Highway is located immediately south of the site followed by rural residential properties and agricultural land.

West: The Main South Railway line borders the site to the east.

A vacant parcel of land within the railway corridor is located directly west of the site followed by a nursery, a livestock sale yard and agricultural land.

A Caltex Petroleum Truck Stop and former fuel depot are located to the southwest of the site on Sloane Street.

2.3 Site history

The railway line from Marulan to Goulburn opened on 27 May 1869 and a railway depot was constructed by the NSW Government Railways on the southern outskirts of town at this time. It is understood that this included the construction of the engine shed at the site. The NSW Government Railways opened the Goulburn Roundhouse in 1918, which replaced an earlier locomotive depot and consisted of a 42-road Roundhouse. Both new and old locomotive depots operated simultaneously until 1935. The old depot was demolished in 1941.

The Roundhouse was closed in 1981, and leased to the Goulburn City Council for use by a historical society to restore and maintain heritage locomotives, railway vehicles and railway orientated machinery and equipment. A summary of key current and historical site features has been summarised within *Detailed Site Investigation* (Cavvanba, 2021a) and as such, has not been reproduced within this report.

2.4 Environmental setting

2.4.1 Topography and hydrology

The site is situated at approximately 638 m AHD within the Southern Tablelands region of NSW. The site area is relatively flat with the broader area surrounding the site sloping the east and north towards the Mulwaree River. An escarpment is located to the west of the site beyond Sloane Street which is present at an elevation approximately 40 higher than the site.

Surface water on-site is understood to be predominantly uncontrolled and would generally pool on-site and permeate the unsealed ground surface that covers the site, however in moderate – heavy rainfall surface water would follow the local topography and drain towards Braidwood Road away from the rail corridor and eventually into the municipal stormwater system. More broadly, surface water is expected to flow east eventually discharging to the Mulwaree River approximately 570 m from the site boundary. The Wollondilly River is located approximately 3.8 kilometres (km) north of the site.

It is noted that an open drainage line is located immediately adjacent to the south of the site. However, based on the orientation and layout of the site, surface water is not anticipated to drain to this area.

2.4.2 Soils and geology

Soils

Based on a review of the *Atlas of Australian Soils*, soils beneath the site are characterised as Sodosol described as the following:

Sodosol: Undulating to hilly country: chief soils are hard neutral and acid yellow mottled soils (Dy3.42 and Dy3.41) in a general pattern as follows: (i) undulating to hilly slopes of various (Dy) and (Dr) soils, including (Dy3.41), (Dy3.42), (Dy3.2), (Dr2.2), (Dr2.4); (ii) (Dy3.42) and sometimes (Dr3.42) soils in basins which merge with unit Va21 and lower-lying sites generally; and (iii) less frequently (Gn2. 15) and (Gn2.25) soils on gently undulating areas, usually situated between (i) and (ii).

The soil profile observed during the DSI was reported to consist of fill material which was reported to extend to depths of up to 2.5 m on-site, comprising spent coal ash and/or coal fragments, ACM and other buried waste material. Natural sandy clays and clays were reported to underlay fill material at the site to the maximum depth of investigation, being 10.0 m.

Geology

According to the *Goulburn 1:250,000 Geological Series Sheet 55-12 (Second Edition, 2013)*, the site is underlain by Cainozoic Aged alluvium consisting of gravels and sands overlying Palaeozoic Aged Gunday beds consisting of sandstone, siltstone volcanic mudstone and lithic-quartz sandstone.

2.4.3 Hydrogeology

According to the DSI, groundwater beneath the site was observed to be present within an unconfined water bearing zone in natural clays and sandy clays at depths of between approximately 4 m to 8 m below ground level (629.9 m AHD and 633.6 m AHD). Groundwater was shallowest in the north-eastern portion of the site.

Groundwater elevations indicated that groundwater flow was predominantly in a northerly direction, generally aligning with the general topographic slope of the site and towards the Wollondilly River.

It is important to note that groundwater flow direction can be influenced locally and regionally by not only surface topography, but recharge and discharge areas, horizontal and vertical inconsistencies in the types, location and orientation of subsurface soils or bedrock, and proximity to water extraction / pumping bores.

Groundwater Bore Search

A total of five registered groundwater bores were located within a 1,000 m radius of the site (Cavvanba, 2021a). Groundwater bore information from these bores has been provided within Table 2.1, below.

Table 2.1: Licensed bore summary

Bore ID	Registered use	Distance from site (m)	Geology	Depth (m)	Standing water level (m)
GW105739	Stock / Domestic Purposes	~195m (South)	Sand / Gravel / Clay	78.00	2.00
GW110381	Recreation (groundwater)	~689m (Northeast)	Gravel / Clay / Siltstone	54.00	5.00
GW064585	Stock / Domestic Purposes	~765m (North)	Clay / Gravel / Shale	15.80	-
GW071524	Monitoring	~887m (North)	Silty Sand / Silty Clay	6.50	5.30
GW102093	Domestic	~907m (Northeast)	Sandy Clay / Gravel / Shale	27.40	0.60

3.0 Previous environmental investigations

A review of previous environmental investigations was completed and summarised as part of *Detailed Site Investigation* (Cavvanba, 2021a). A summary of the most recent investigation is provided in Section 3.1, below. This information was reviewed, and the associated data was used to form the basis for this SAQP.

3.1 Detailed site investigation (Cavvanba, 2021a)

3.1.1 Objective

Cavvanba was commissioned by ARTC to undertake a DSI at the site. The objective of the works were to:

- further understand, and assess the nature and extent of contamination at the site;
- provide an assessment on whether the contamination presents an unacceptable risk to human health and/or the environment under the current commercial/industrial land use scenario; and
- provide an assessment as to whether the site requires notification to the NSW EPA under the CLM Act.

3.1.2 Scope

The scope of work included a desktop review of available background and publicly available for the site, supplemented by the following intrusive investigation:

- advancement of twelve boreholes using mechanical drilling techniques to a maximum depth of 10 m;
- advancement of 15 test pits using an excavator to natural soils, being a maximum depth of 2.3 m;
- conversion of eight boreholes to groundwater monitoring wells; and
- gauging and sampling of newly installed and existing monitoring wells.

3.1.3 Conclusions and recommendations

The following conclusions were reported:

- *The site has a long history of industrial activities, with railway operations commencing in the late 1800's. The NSW Government Railways opened the Goulburn Roundhouse in 1918, which replaced an earlier locomotive depot. Both new and old locomotive depots operated simultaneously until 1935. The old depot was demolished in 1941. The Roundhouse was closed in 1981, and later leased to the Goulburn City Council for use by a historical society to restore and maintain heritage locomotives, railway vehicles and railway orientated machinery and equipment.*
- *The primary contaminating activity at the site was considered to be the current and historical use of the site as a Roundhouse, including locomotive maintenance and repair activities, historical land filling and poor waste disposal practices.*
- *The soil profile beneath the site was observed to generally consist of fill material which was reported to extend to depths of up to 2.5 m on-site, comprising spent coal ash and/or coal fragments, ACM and other buried waste material. Natural sandy clays and clays were reported to underlay fill material at the site to the maximum depth of investigation, being 10.0 m.*
- *Groundwater beneath the site was observed to be present within an*

unconfined water bearing zone in natural sandy clays and clays at depths of between 4.1 m and 8.7 m.

- *Soil analytical data collected as part of this investigation indicated the following commercial/industrial screening criteria exceedances:*
 - *widespread lead contamination within fill material with a reported maximum concentration of 9,440 mg/kg; and*
 - *TRH in fill material within the former refuelling gantry and adjacent to the Roundhouse building maintenance pits.*

- *Non-friable asbestos containing material was identified to be widespread, both in and on soils across the site. A significant quantity of buried and layered ACM was identified in the southern portion of the site to a maximum depth of 2.2 m.*

- *The nature and extent of groundwater contamination at the site can be summarised as follows:*
 - *evidence of Light Non-Aqueous Phase Liquid (LNAPL) was not observed;*
 - *groundwater analytical concentrations were reported below the applicable CRC CARE HSLs for vapour intrusion;*
 - *the reported TRH concentrations within monitoring well MW02, located adjacent to the former refuelling gantry exceed the solubility limits for TRH, and therefore may be indicative of a potential source of LNAPL within this location.*

- *Through the development of the conceptual site model, potentially complete source-pathway-receptor linkages resulting in a potential risk to human health receptors under a commercial/industrial land use scenario have been identified which require further assessment.*

A summary of key outstanding data gaps, associated recommendations and the current management strategy has been provided in Section 1.1 of this report.

4.0 Data quality objectives

Prior to commencement of the intrusive investigation program, Data Quality Objectives (DQOs) were established for the project in line with the requirements and process outlined in NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd edition)* and included within the SAQP.

These DQOs were developed to define the type and quality of data required from the site investigation program to achieve the project objectives outlined in Section 1.3. The DQOs were selected with reference to relevant guidelines published by the NSW Environmental Protection Authority (EPA), Australian and New Zealand Environment and Conservation Council (ANZECC) and National Environment Protection Council (NEPC), which define minimum data requirements and quality control procedures. These decision rules were developed to refine the objectives of the data collection investigation, to ensure the data collected was representative and provided the necessary data to enable a justifiable statement regarding the extent of contamination at the site, and an assessment on whether the contamination presents an unacceptable risk to human health and/or the environment.

The seven-step DQO approach, as identified in NSW EPA (2017) is provided within the SAQP.

5.0 Site investigation

The fieldwork program was undertaken in accordance with the SAQP, by Mr Michael Wright of Cavvanba in June and July 2021. The fieldwork program comprised of the following:

- drilling, soil sampling and monitoring well installation on 8 and 9 June;
- test pitting and soil sampling on 6 and 7 July; and
- groundwater monitoring event on 5, 7 and 8 July.

5.1 Investigation strategy

The investigation strategy has been separated into the following components, in accordance with the SAQP:

- *Component 1 – TRH in groundwater.* TRH was reported to exceed the solubility limits within monitoring well MW02, located adjacent to the decommissioned refuelling gantry (Cavvanba, 2021a). The approach to this component was to further characterise the extent of TRH in groundwater at this location.
- *Component 2 – Site infilling and waste disposal areas.* The site has been widely filled including the presence of buried waste (including ash and asbestos containing material), particularly in the southern portion of the site. This fill material comprises lead at concentrations exceeding the commercial/industrial human health criteria (Cavvanba, 2021a). The proposed approach to this component was to further characterise the extent of asbestos containing material and lead in fill material, particularly within the southern and eastern portion of the site where there is the potential for unrestricted access (i.e. outside of the permitter fence line).
- *Component 3 – Groundwater monitoring.* The groundwater monitoring event was completed to:
 - complement Component 1 of TRH in groundwater;
 - ensure that any changes in contaminant concentrations can be detected;
 - commence the collection of sufficient information to demonstrate plume stability, or otherwise; and
 - assist in the management of appropriate protection measures for groundwater human and ecological health.

5.1.1 Component 1 – TRH in Groundwater

The assessment of TRH in groundwater at monitoring well location MW02, consisted of a targeted sampling approach. The strategy is described in Table 5.1, below. All investigation locations are presented in Figure 3.

Table 5.1: TRH assessment strategy

Location ID	Media	Rationale
MW09	Soil and groundwater	Down-hydraulic gradient to the north of MW02.
MW10	Soil and groundwater	Down-hydraulic gradient to the northeast of MW02.
MW11	Soil and groundwater	Cross-hydraulic gradient to the southeast of MW02.
MW12	Soil and groundwater	Cross-hydraulic gradient to the southeast of MW02.

Location ID	Media	Rationale
MW13	Soil and groundwater	Down / cross-hydraulic gradient of the former workshop and roundhouse buildings and immediately adjacent to the administration building.

5.1.2 Component 2 – Site infilling and waste disposal areas

The assessment of the buried waste and fill was implemented to further characterise the nature and extent of asbestos containing material and lead in fill material in the southern and eastern portion of the site. A total of thirty test pits were advanced to a maximum depth of 2.5 m and into natural soils, where practicable to vertically delineate any buried waste / fill material. The sampling strategy was based on a systematic approach, which was modified slightly to target specific features such as the raised fill area which extends beyond the perimeter fence line in the south-eastern portion of the site. All test pitting locations presented on Figure 3.

5.1.3 Component 3 – Groundwater monitoring event

The groundwater monitoring event incorporated all newly installed and existing monitoring wells.

5.2 Methodology

5.2.1 Soil investigation method

Soil investigation and sampling activities were undertaken in accordance with Cavvanba's fieldwork procedures. Sampling locations are presented on Figure 3.

All boreholes were advanced using a mechanical drilling fitted with solid flight augers to a maximum depth of 9 m. All test pitting locations were advanced using an excavator into natural soils, where practicable at a maximum depth of 2.5 m. Test pit location TP30 was terminated at approximately 2.2 metres depth due to the presence of asbestos containing material and the collapse of the test pit walls, therefore excavation to natural soils at this location could not be achieved.

Soil properties were logged by an appropriately trained and experienced environmental scientist in general accordance with *Australian Standard AS 1726-1993*. Representative soil samples were collected for laboratory analysis at selected locations, based on visual and/or olfactory evidence of the following:

- multiple layers of fill material;
- changes in the soil profile; and
- potential contamination.

Representative soil samples were collected, to the extent practicable, in accordance with techniques described in *Australian Standard AS4482-2005* (Parts 1 and 2) to maintain the representativeness and integrity of the samples.

Field screening was conducted in accordance with Cavvanba's fieldwork procedures using a calibrated photo-ionisation detector (PID) fitted with a 10.6 eV lamp. Calibration certificates are included as Appendix A. Where practicable, soil samples were collected at the surface, and at 0.5 m intervals or where significant geological changes, or evidence of potential impact was observed, until termination. Soil samples were placed in a "zip-lock" bag, sealed and the resultant headspace was screened for the presence of ionisable volatile compounds. Where the presence of volatiles or other impact was suspected, additional samples were collected.

All samples retrieved from boreholes were collected directly from the solid flight auger during drilling. Representative soil samples were collected by advancing the lead solid flight auger to approximately 0.2 metres above the selected sample depth followed by 'reaming' of soil cuttings from the borehole to remove surplus soil cuttings. The lead solid flight auger was subsequently advanced to the nominated sample depth prior to raising to the surface. The soil sample was immediately collected directly from the solid flight auger using a gloved hand, carefully selecting soil which was not in direct contact with the auger. The representative soil sample was placed directly into the sample container. The potential for loss of volatiles was minimised by sampling from larger clods of soil and minimising the duration between sample extraction and placement into the sample container. Soil samples during test pitting were collected from the centre of the excavator bucket to reduce the potential for cross contamination between sampling locations. Sample jars were sealed and immediately placed in an insulated cooler, on ice, and stored to minimise the potential loss or degradation of volatile compounds. Samples were shipped under chain of custody documentation to the NATA accredited analytical laboratory.

Test pit reinstatement

Upon completion, all test pits were backfilled in reverse order, to the extent practicable, to prevent excessive vertical mixing of potentially contaminated subsurface material.

Decontamination procedure

All down-hole drilling and sampling equipment were decontaminated by initially removing any residual soil with a stiff brush, followed by washing the equipment with a Decon 90 / potable water solution, where applicable.

5.2.2 Groundwater investigation method

Monitoring well installation

Five soil bores were converted to groundwater monitoring wells in accordance with Cavvanba's fieldwork procedures. Groundwater monitoring well locations are presented on Figure 3.

The following methodology was implemented to install groundwater monitoring wells, with well construction detailed presented within the borehole logs, included as Appendix B:

- Monitoring wells were constructed of heavy duty 50mm diameter class 18uPVC with factory slotted screen (0.4mm slots) and well casing. Where practicable, the wells were screened within groundwater bearing strata in accordance with Cavvanba's fieldwork procedures and constructed to allow the potential ingress of non-aqueous phase liquids (NAPLs), if present.
- The well casing and screen were inserted into the borehole. Washed and graded filter sand was poured into the annulus between the well screen and borehole wall, to a level such that sand covered the screened level and extended above the top of the screen.
- Bentonite was then poured on top of the sand and hydrated to effectively seal off the well from surface water or perched / shallow groundwater inflows, and finished with a flush mounted gatic cover.

Monitoring well development

Following monitoring well installation, each monitoring well was developed using a bailer dedicated to each location to remove any fine materials potentially introduced during drilling, and to optimise hydraulic conductivity with the surrounding aquifer. Wells were considered developed when either a minimum of 10 well volumes had been removed or when water quality parameters had stabilised.

Monitoring well construction details are presented within the borehole logs in Appendix B.

Groundwater purging and sampling protocol

Groundwater purging and sampling was conducted on 5, 7 and 8 July 2021, by Mr Michael Wright of Cavanba. Prior to purging, wells were gauged with an interface probe to assess the depth of groundwater across the site. Samples were collected directly from single use disposable tubing using low flow sampling techniques in accordance with *Cavanba Fieldwork Procedures for Groundwater sampling*.

Field parameters, including pH, redox potential (Eh), dissolved oxygen (DO), electrical conductivity (EC) and temperature were measured using a water quality meter (HAN 98194-4M), which was calibrated prior to use.

During sample collection and equipment decontamination, disposable nitrile gloves were used to prevent dermal contact with groundwater. Samples were collected directly from dedicated tubing and placed into appropriately preserved, laboratory prepared sample containers. The containers were filled to minimise headspace, before being sealed and appropriately labelled. Labels included the following information:

- sample identification number;
- sampler;
- job number; and
- date of collection.

Samples were sealed and immediately placed on ice in a cooler to minimise potential for degradation of the sample. Samples were shipped under chain of custody documentation to the NATA accredited analytical laboratory.

Groundwater field forms, including calibration records are included as Appendix A. Groundwater monitoring well installation details are included within the borehole logs, included as Appendix B.

Survey

The location and relative level (AHD) of each newly installed groundwater monitoring well was surveyed by a registered surveyor from Southern Cross Consulting Surveyors Pty Ltd on 7 July 2021. The elevation of the highest point of the top of the uPVC well casing was surveyed to facilitate appropriate groundwater elevation calculations and groundwater flow direction interpretations. Groundwater monitoring well elevations and location details are presented in Tables 8 and 9.

5.3 Assessment criteria

The adopted Tier 1 assessment criteria have been sourced from guidelines made or approved under the *Contaminated Land Management Act (1997)*, and were based on a review of the following reference documents:

- ASC NEPM (2013) – *Schedule B1: Investigation Levels For Soil and Groundwater (2013)*.

- CRC Care Technical Report no. 10 – Health screening level for petroleum hydrocarbon in soil and groundwater – Part 2: Application Document (CRC Care, 2011).
- National Health and Medical Research Council (NHMRC) (2011) *Australian Drinking Water Guidelines* (Updated March 2021) (NHMRC (2011) ADWG).

In September 2011, CRC CARE published published technical report No. 10, *Health Screening Levels for petroleum hydrocarbons in soil and groundwater*. This document provides HSLs for human exposure to volatile organic compounds based upon the site-specific soil compositions of the potential vapour pathway in conjunction with classifications of receptor land-uses to more accurately assess risk to potential receptors. These HSLs have been applied to the data collected during these investigations with the following considerations:

- The general land use in the immediate vicinity of the area where contamination has been identified is commercial/industrial (on-site).
- The natural lithology encountered throughout the investigation was primarily clay.
- Depth to groundwater within monitoring wells sampled across the site was measured to range between be 4.0 m and 7.2 m.

5.3.1 Soil

In accordance with the ASC NEPM (2013), health investigation levels are scientifically based, generic assessment criteria designed to be used in the first stage of an assessment of potential risks to human health from chronic exposure to contaminants. They are intentionally conservative and are based on a reasonable worst-case scenario. For soil, the appropriate and adopted criteria are based on the ASC NEPM (2013), in particular the health investigation levels (HILs), environmental investigation levels (EILs), environmental screening levels (ESLs) and health screening levels (HSLs) applicable for commercial/industrial land use scenarios.

These land use scenarios make generic estimates of potential human exposure to soil contaminants, scientifically based assumptions are made about the environment, human behaviour, the physicochemical characteristics of contaminants, and the fate and transport of contaminants in soil, within each of the land use categories. The HILs are derived by integrating these exposure estimates with toxicity reference values, that is, tolerable daily intakes, acceptable daily intakes and reference doses, to estimate the soil concentration of a substance that will prevent exceedance of the toxicity reference value under the defined scenario. The toxicity reference values are generally based on the known most sensitive significant toxicological effect. It is acknowledged that the dominant users of commercial/industrial sites are adult employees, who are largely involved in office-based activities or light indoor industrial activities, and the outdoor areas are largely covered by hardstand with some limited areas of landscaping or lawns and facilities. Opportunities for direct access to soil by employees using these facilities are likely to be minimal, but there may be potential for employees to inhale, ingest or come into dermal contact with dust particulates derived from soil on-site.

Health screening levels

HSLs for commercial/industrial space (HSL-D) and intrusive maintenance workers were adopted. This screening criterion is designed to assess the potential risk to human health via inhalation of petroleum compounds. Direct contact criteria for petroleum hydrocarbons available through CRC CARE (2011) was applied to the upper two metres of the soil profile where a pathway may be present.

Ecological screening and investigation levels

The ASC NEPM (2013) EILs and ESLs for commercial/industrial sites are appropriate for the assessment of risks to ecological receptors. The EILs are numerical limits that are designed to protect soil and terrestrial flora and fauna (including pets and wildlife) and soil microbial processes from experiencing substantial deleterious effects caused by contamination. The ASC NEPM (2013) provides EILs for aged and fresh contamination for metal constituents including nickel, chromium, copper, zinc and lead. For the purposes of EIL derivation, a constituent incorporated in soil for at least two years was considered to be aged. Given the site has been operational since approximately the early 1900's, any identified impacts are likely to be primarily related to aged contamination. Therefore, EILs for aged contamination have been adopted.

Additionally, the ASC NEPM (2013) prescribes derivation of EILs for a number of contaminants through consideration of site-specific physical parameters. This criterion was determined for physical parameters using laboratory derived values from the DSI which have been averaged and adopted to provide site-specific investigation levels.

Aesthetic considerations for petroleum hydrocarbons – management limits

Petroleum hydrocarbon data collected during this investigation was also screened against petroleum hydrocarbon management limits (management limits) according to ASC NEPM (2013). The management limits are designed to protect against fire and/or explosion hazards, effects of hydrocarbons on buried infrastructure and the formation of NAPL. These criteria are not used for risk assessment purposes, however, are taken into consideration when determining if issues exist on site which may require management. Management limits have been included to avoid or minimise these potential effects.

Asbestos

An appropriate assessment of asbestos is undertaken in stages, with the first stage being an assessment of the type and condition of the asbestos or ACM. Once this has been established, a health screening level can be applied to the relevant type of asbestos, which is further discussed below.

The ASC NEPM (2013) summarises typical asbestos contamination into three groups, being:

- **ACM** is asbestos containing materials, bonded in a matrix such as cladding, fencing or vinyl tiles, that will not pass through a 7 mm x 7 mm sieve. ACM can usually be detected visually.
- **FA** is fibrous asbestos, including friable or severely weathered ACM. FA can usually be detected visually.
- **AF** is asbestos fines, including free fibres, small FA bundles, and ACMs that can pass through a 7 mm x 7mm sieve.

The assessment of bonded ACM is the recommended method to address total asbestos contamination where friable asbestos (FA) and asbestos fines (AF) derived from bonded ACM are not likely to be significant. Bonded ACM in good condition usually presents a low risk to human health. If the main form of asbestos is ACM, an assessment for free fibres is not warranted where:

- < 10% of the total ACM is significantly damaged (ACM pieces less than 7 mm x 7 mm are noted); or
- ACM cannot be crushed/crumbled with hand pressure.

The ASC NEPM (NEPC, 2013) states that for bonded asbestos cement fragments in reasonably good condition, it can be assumed that the distribution of any co-located asbestos fines associated with ACM is likely to be less than 10% of the total material present. In these cases, it can then be assumed that asbestos fines impacts are trivial and unlikely to exceed 0.001 % w/w asbestos across the soil profile, and therefore not present an unacceptable risk of airborne asbestos fibres, and not require sampling for asbestos fines.

Health screening levels for bonded ACM are provided in ASC NEPM (NEPC, 2013), which have been summarised in Table 5.2, below.

Table 5.2: Health screening levels for asbestos contamination in soil

Form of asbestos	Health Screening Level (weight/weight)			
	Residential A	Residential B	Recreational C	Commercial/Industrial D
Bonded ACM	0.01%	0.04%	0.02%	0.05%
FA and AF (friable asbestos)	0.001%			
All forms of asbestos	No visible asbestos for surface soil (top 10 cm should be free of all visible asbestos)			

For this site, the Commercial/Industrial D criteria of 0.05% is applicable given the current land use scenario. At these concentrations, bonded ACM is unlikely to generate elevated levels of airborne fibres, however it is acknowledged that some bonded fragments may remain intermixed within the soil.

5.3.2 Groundwater

The assessment criteria adopted for groundwater have been classified according to the CRC CARE criteria and compared to the appropriate HSLs. The CRC CARE (2011) *Part 2: Application document* states that the selection of the appropriate soil category is significant for volatile chemicals, as it can affect the rate of vapour transport and hence the value of the HSLs for vapour inhalation. Determining which soil classification applies at a site may be established by grain size analysis, or by visual observation. In order to screen groundwater results against relevant criteria, Cavanba adopted a visual observation approach to determine the appropriate soil category. In general, the dominant category of the soil overlying the source of contamination is clay. Given this, the adopted HSLs were based on a clay geology, and an arbitrary depth to ground of between 4 to 8 m for comparative purposes only. Cavanba acknowledges that where shallow groundwater (<2 m) is present on-site, a site-specific risk assessment is recommended due to the sensitivity of the derived HSL to depth to groundwater. The applicability of a site-specific risk assessment is further discussed in Section 8.

The NHMRC (2011) ADWG and *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (<http://www.waterquality.gov.au/anz-guidelines> as accessed 5 August 2021) (ANZG 2018) provides assessment criteria for the protection of drinking water and freshwater environments, respectively. This criterion has been adopted as Tier 1 criteria with their applicability further discussed in Section 8.

In accordance with ANZG (2018), a level of protection is defined as the degree of protection afforded to a water body based on its ecosystem condition (current or desired health status of an ecosystem relative to the degree of human disturbance). The level of protection informs the acceptable water / sediment quality for a waterway. There are three recognised categories of current or desired ecosystem condition in the water quality guidelines, the level of protection corresponds to the following ecosystem condition categories:

- high conservation or ecological value systems;
- slightly to moderately disturbed systems; and
- highly disturbed systems.

The general policy nationally is that the level of protection applied to most waterways is the protection of 95% of freshwater species. A lower level of 80% protection may apply to 'highly disturbed' systems, however, the 80% protection level may only be considered as a short-term measure (e.g. a maximum of five years in many cases), with the aim of eventually restoring it to the 95% status. It is not acceptable to allow poor environmental management to continue beyond the short term. A 95% species protection levels is to be applied for slightly to moderately-disturbed ecosystems (most urban catchments), and the 99% species protection levels for pristine or vulnerable ecosystems, or where the contaminants are intractable (e.g. bioaccumulative).

5.4 Laboratory analysis

All soil and groundwater, samples were collected and analysed for a range of the following potential and known COCs, in accordance with the SAQP:

- total recoverable hydrocarbons (TRH);
- benzene, toluene, ethylbenzene, xylenes and naphthalene (BTEXN);
- polycyclic aromatic hydrocarbons (PAHs);
- heavy metals including arsenic (As), mercury (Hg), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), nickel (Ni) and zinc (Zn);
- volatile organic compounds (VOCs);
- organochlorine and organophosphate pesticides (OCPs and OPPs);
- polychlorinated biphenyls (PCBs); and
- asbestos (presence / absence).

5.5 Data usability

A background to data usability is provided in Appendix C. All site work was completed in accordance with Cavvanba's fieldwork procedures, including a QA/QC program.

A data usability assessment has been performed for the sampling undertaken during this investigation, as summarised in Appendix C and includes the following:

- summary of field quality assurance/quality control;
- field quality control soil samples summary; and
- summary of laboratory quality assurance/quality control.

Overall, the data usability assessment shows that the data is of suitable quality to support the conclusions made in this report.

6.0 Results

6.1 Site geology observations

Detailed descriptions of the site geology are presented in Table 1 and within the borehole logs, included as Appendix B. A photographic log is provided as Appendix D.

The key field observations made during the soil investigation are outlined below:

Component 1 – TRH in groundwater

- The soil profile observed during the advancement of groundwater monitoring wells MW09 to MW13, consisted of a black sandy gravel / ash fill material to a maximum depth of 1.5 m, underlain by a natural sandy clay / clay / gravelly clay to the maximum depth of investigation of 9.0 m.
- Groundwater strike which was characterised as a 'moist' soil moisture content observed within gravelly clays at depths ranging from 4.8 m to 8.5 m.
- PID field screening provides a semi-quantitative indication of the potential presence of volatile hydrocarbons in soil. PID field screening results were reported at a maximum concentration of 3.4 parts per million (ppm) (isobutylene equivalent) in the headspace of the soil samples collected, indicating a low probability of volatile hydrocarbons being present.
- A slight petroleum hydrocarbon odour was noted during the advancement of groundwater monitoring well MW10, from approximately 6.9 metres in depth, and a corresponding PID field screening concentration of 0.4 ppm. Petroleum hydrocarbon odours or staining were not identified during the advancement of the remaining groundwater monitoring wells.

Component 2 – Site infilling and waste disposal areas

- The soil profile observed within test pits advanced within the site infilling and waste disposal areas consisted of a black sandy gravel / ash fill material of varying thicknesses to a maximum depth of 2.0 metres overlying a natural silty clay / sandy clay.
- PID field screening was reported at a maximum concentration of 0.2 ppm indicating a low probability of volatile hydrocarbons being present. Petroleum hydrocarbon odours or staining were not identified during the test pitting completed as part of this investigation.
- Buried waste material including bricks, glass, concrete, plastic, rags and/or steel were identified at a number of locations advanced, however most notable within test pit locations TP23, TP27, TP28 and TP30 within the fill area located to the east of the former workshop / machine shop.
- ACM sheeting was observed within test pitting location TP30, from approximately 1.7 m to 2.2 m in depth. The fragments were observed to be non-friable as they were not severely degraded and could not be broken or crumbled by hand pressure. Potential ACM fragments were not identified within any other test pitting locations advanced as part of this investigation.

6.2 Groundwater observations

All newly installed groundwater monitoring wells were developed following their installation on 8 and 9 June 2021. To enable sub-surface conditions to stabilise and

groundwater levels to equilibrate, all newly installed and existing groundwater monitoring wells were sampled on 5, 7 and 8 July 2021.

Groundwater gauging results and field quality parameters are presented in Table 9 and 10, respectively.

The key observations made during the groundwater investigation are outlined below:

- Standing water levels (SWLs) ranged from 4.022 m below the top of well casing within MW10 in the north-eastern portion of the site, to 7.230 m within MW03, in the north-western portion of the site.
- No indication of LNAPL was observed within any monitoring wells during the gauging and sampling event undertaken.
- Purged water during sampling was observed to vary from being clear to slightly cloudy.
- Petroleum hydrocarbon odours and/or sheens were reported during sampling of monitoring wells MW02, MW06 and/or MW10.
- Electrical conductivity ranged from 389 μScm^{-1} at MW06 to 2,344 μScm^{-1} at W1. Corresponding total dissolved solids were calculated at 261 mg/L at MW06 to 1,570 mg/L at W1, indicating a good to unacceptable palatability for drinking water purposes.
- pH ranged from 6.80 at MW06 to 7.78 at MW03, indicating neutral conditions.
- A ruptured below ground water pipe was identified within the immediately vicinity of the former diesel refuelling gantry during the groundwater monitoring event on 5, 7 and 8 July.

7.0 Analytical results

7.1 Soil

Soil analytical results were screened against the relevant screening criteria as described in Section 5.3. The analytical results have been summarised by contaminant in Table 7.1, below, and in their entirety in Tables 2 to 6. Laboratory certificates are presented in Appendix E.

Table 7.1: Soil analytical summary

Analyte	Health criteria	Ecological criteria	Analytical data			
	HIL / HSL (mg/kg)	EILs/ESLs (mg/kg)	No. samples analysed	Number of detects	Max' (mg/kg)	Meets screening criteria?
<i>Metals</i>						
Arsenic	3,000	160	10	2	40	Yes
Cadmium	900	-		0	-	Yes
Chromium	3,600	1,000		10	44	Yes
Copper	240,000	<u>300</u>		10	<u>1,050</u>	<u>No</u>
Nickel	6,000	310		10	23	Yes
Zinc	400,000	740		9	341	No
Mercury	730/180	-		1	0.4	Yes
Lead	1,500	1,800	65	65	1,540	No
<i>TRH and BTEXN</i>						
Benzene	4 ¹	75	10	0	-	Yes
Toluene	99,000	135		0	-	Yes
Ethylbenzene	27,000	165		0	-	Yes
Xylenes	81,000	180		1	2.5	Yes
Naphthalene	29,000	370		-	-	Yes
F1 TRH C ₆ -C ₁₀	310 ¹	215		-	-	Yes
F2 TRH >C ₁₀ -C ₁₆	1,000 ²	170		-	-	Yes
F3 TRH >C ₁₆ - C ₃₄	27,000 ³	1,700		3	160	Yes
F4 TRH >C ₃₄ - C ₄₀	10,000 ²	3,300	1	180	Yes	
<i>PAHs</i>						
B(a)P TEQ	40	-	10	0	-	Yes
B(a)P	-	-		0	-	Yes
Total (PAHs)	4,000	-		0	-	Yes
<i>OCPs / OPPs and PCBs</i>						
Sum of DDD + DDE + DDT	3,600	360	10	0	-	Yes
PCBs	7	-		0	-	Yes
<i>Asbestos</i>						

Analyte	Health criteria	Ecological criteria	Analytical data			
	HIL / HSL (mg/kg)	EILs/ESLs (mg/kg)	No. samples analysed	Number of detects	Max' (mg/kg)	Meets screening criteria?
Asbestos	Detect	-	1	1	-	No

Table notes:

- = not detected above the LOR / no applicable assessment criteria.

Refer to Tables 2 – 6 for a complete list of screening criteria.

¹ - Health screening levels for commercial/industrial landuse, 0m to >1m depth, TRH and BTEXN.

² - Management Limits – Commercial and industrial.

³ - Health screening levels for commercial/industrial landuse, direct contact.

7.2 Groundwater

Groundwater analytical results were screened against the relevant screening criteria as described in Section 5.3. The analytical results have been summarised by contaminant in Table 7.2, below, and in their entirety in Tables 11 to 14. Laboratory certificates are presented in Appendix E.

Table 7.2: Groundwater analytical summary

Analyte	Health criteria	Ecological criteria	Analytical data			
	ADWG / HSL D (µg/L)	ANZECC (µg/L)	Samples analysed	Number of detects	Max' (µg/L)	Meets criteria?
<i>Metals</i>						
Arsenic	10	13	16	2	1.0	Yes
Cadmium	2	0.2		0	-	Yes
Chromium	50	<u>1</u>		11	<u>40</u>	<u>No</u>
Copper	2,000	<u>1.4</u>		<u>1</u>	<u>2.0</u>	<u>No</u>
Lead	10	3.4		0	-	Yes
Nickel	20	11		3	4.0	Yes
Zinc	-	<u>8</u>		6	<u>22</u>	<u>No</u>
Mercury	1	0.06		0	-	Yes
<i>TRH and BTEXN</i>						
Benzene	1 / 5,000	950	16	0	-	Yes
Toluene	800 / NL	180		0	-	Yes
Ethylbenzene	300 / NL	80		1	2	Yes
Xylenes	600 / NL	75		0	-	Yes
Naphthalene	-	16		1	15	Yes
TRH C ₆ -C ₉	-	-		1	30	Yes
F1 TRH C ₆ -C ₁₀	NL	-		1	30	Yes
F2 TRH >C ₁₀ -C ₁₆	NL	-		2	1,160	Yes
F3 TRH >C ₁₆ - C ₃₄	NL	-		3	1,740	Yes
F4 TRH >C ₃₄ - C ₄₀	NL	-		0	-	Yes
<i>PAHs</i>						
B(a)P	0.1 ¹	-	16	0	-	Yes
Phenanthrene	-	<u>0.6</u>		1	<u>1.6</u>	<u>No</u>
Total (PAHs)	-	-		1	13.7	Yes
<i>SVOCs and VOCs</i>						
cis-1.2-Dichloroethene	60	-	16	0	-	Yes
Trichloroethene	-	-		0	-	Yes
Vinyl chloride	-	-		0	-	Yes
Chlorobenzene	300	55		0	-	Yes
Chloroform	370	-		1	27	Yes
Bromodichloromethane	-	-		1	11	Yes

Table notes:

- = not detected above the LOR / no applicable assessment criteria.

Refer to Tables 11 – 14 for a complete list of screening criteria.

8.0 Discussion

8.1 TRH in groundwater

Dissolved phase petroleum hydrocarbon contamination in groundwater was reported at a maximum concentration of 40,700 µg/L (F2 TRH >C₁₀ – C₁₆) at monitoring well location MW02, located immediately adjacent to the former diesel refuelling gantry during the DSI (Cavvanba, 2021a). The elevated groundwater concentrations within this area corresponded to those previously reported by J&K (1997), where a concentration of TRH >C₁₀ – C₁₄) was reported at 870,000 µg/L in groundwater that had accumulated within a borehole during advancement. These concentrations exceeded the solubility limits for TRH, and therefore may have been indicative of a potential source of LNAPL.

The approach to the assessment of petroleum hydrocarbon impacts in groundwater included the advancement of four boreholes and subsequent conversion to groundwater monitoring wells to further characterise the extent of TRH impacts within the vicinity of the former diesel refuelling gantry. This was supplemented by groundwater monitoring of all newly installed and existing monitoring wells.

The nature and extent of TRH contamination within this area is discussed as follows:

Soil

- A slight hydrocarbon odour was noted during the drilling of groundwater monitoring well MW10, at a depth of 6.9 m – 7.0 m. No other indications of petroleum hydrocarbon impacts were observed during drilling of the remaining groundwater monitoring wells.
- All soil samples collected during the drilling of monitoring wells MW09 to MW12, and analysed for COCs were reported below the adopted human health assessment criteria. Concentrations of TRH (C₁₆ – C₃₄) and/or xylene were reported above the laboratory limit of reporting at three locations, however these were limited to surficial samples and were below the adopted human health and ecological assessment criteria.

Groundwater

- Concentrations of TRH, BTEXN and PAHs and VOCs were reported below the laboratory LOR in all samples collected and analysed from newly installed monitoring wells MW09 to MW12 installed to delineate impacts within the vicinity of the former refuelling gantry.
- Chloroform and bromodichloromethane were reported at concentrations above the laboratory limit of reporting at respective concentrations of 27 µg/L and 11 µg/L. The constituents are chemically grouped as trihalomethanes, and are present in drinking water as a result of the disinfection process using chlorination. In major Australian reticulated supplies, concentrations of total trihalomethanes can range up to 600 µg/L (ADWG, 2011). The presence of these constituents is likely an indication of a potential potable water source / influence at this location which correlates to the observation of the ruptured below ground water pipe during the completed of the groundwater monitoring event. However, the concentrations reported are not considered to represent a risk to human health.
- Dissolved phase petroleum hydrocarbon contamination in the F2 TRH >C₁₀ – C₁₆ range in monitoring well MW02, was reported two orders of magnitude below the previous groundwater monitoring event at a concentration of 270 µg/L.

- Petroleum hydrocarbon concentrations in monitoring well MW02, are limited in extent having been delineated by a reduction in concentrations in MW01 to the north, and absence of detectable petroleum hydrocarbon concentrations in existing and newly installed monitoring located down and cross-hydraulic gradient. However, some uncertainty remains due to the two orders of magnitude reduction in F2 TRH >C₁₀ – C₁₆ and presence of trihalomethanes within monitoring well MW02.

8.2 Site infilling and waste disposal areas

The site has been widely filled including the presence of buried waste (including ash and asbestos containing material), particularly in the southern portion of the site. This fill material comprises lead at concentrations exceeding the commercial/industrial human health criteria.

The approach to this component was to further characterise the extent of asbestos containing material and lead in fill material through the excavation of an additional thirty test pitting locations, particularly within the southern and eastern portion of the site where there is the potential for unrestricted access or access by the public.

The nature and extent of contamination associated with the infilling and waste disposal areas assessed as part of this investigation is discussed as follows:

Lead in soil

- Lead was reported to exceed the adopted health investigation level of 1,500 mg/kg in one test pitting location TP23, at a concentration of 1,540 mg/kg at a depth of 0.9 – 1.0 m. This test pit location was positioned to the east of the perimeter fence line and within the filled area which extends to the south and east of the former workshop / machine shop. The lead exceedance corresponded to fill material present at this location which included waste materials such as general refuse, glass, bricks and steel. Lead concentrations were reported below the adopted health investigation levels in surficial soils at this location and were delineated at depth by the sample collected from the natural silty clay observed from 1.8 m.
- Lead was reported below the adopted health investigation level within all samples collected from surficial soils and fill material collected as part of this investigation.
- The extent of the lead contaminated soils previously identified through the DSI (Cavvanba, 2021) has been suitably delineated to the east and south by the additional sample locations completed as part of this ESA.
- Based on the nature and distribution of the identified lead contamination and anecdotal information provided by site volunteers during this investigation, it may be related to the historical burning of redundant timber railway carriages within this area. It is understood that these carriages included lead-based paint and lead flashing which has contaminated surface soils and intermixed during the historical filling of the site.

Asbestos in and on soil

- ACM was identified in soil in one test pitting location TP30, positioned to the east of the perimeter fence line and within the filled area. The filled area extends to the south and east from the former workshop / machine shop as presented on Figure 2. The fragments were observed from a depth of 1.7 m and reported to be non-friable as they were not severely degraded and could not be broken or crumbled by hand pressure.

- ACM fragments were not identified within any other test pitting locations advanced as part of this investigation.
- The extent of ACM in and on soil previously identified through the DSI (Cavvanba, 2021) has been suitably delineated to the east and south by the additional sample locations completed as part of this ESA.
- The source of ACM is likely associated the inappropriate removal of ACM from the roof of the Roundhouse, demolition of the eastern portion of the Roundhouse and progressive removal of ACM from on-site structures. A graphical representation of the areas of known ACM is presented on Figure 5, which includes areas previously identified during the DSI (Cavvanba, 2021a). However, the areas presented are not exhaustive and are based on both a visual observation of the site surface and observations made during the intrusive investigations. It is acknowledged that some areas on site were covered by a competent grass cover which limited a visual appraisal of the site surface.

8.3 Groundwater monitoring

Groundwater flow direction

The measured standing water levels and calculated groundwater elevations indicate groundwater flow is consistent with that previously reported, predominantly flowing in a north-easterly direction, aligning with the topographic slope of the site. Hydrogeological information has been presented on Figure 4.

Petroleum hydrocarbon contamination

All groundwater samples collected on-site were reported below the adopted CRC CARE HSLs for vapour intrusion. Dissolved phase petroleum hydrocarbon contamination was reported in monitoring well MW06, located adjacent to the Roundhouse where active maintenance is occurring. These impacts are delineated to within the site boundary, having been delineated by groundwater monitoring wells down-hydraulic gradient. The significance and uncertainty associated with these impacts are to be assessed through future groundwater monitoring and a review of on-site waste management procedures.

The significance of TRH in groundwater within the vicinity of the former diesel refuelling area has been discussed in Section 8.1.

Other contaminants of concern

Consistent with the previous groundwater monitoring event, a limited number of exceedances of the adopted ANZG (2018) protection of freshwater guideline were detected in monitoring wells on-site. These reported concentrations are not considered to represent an unacceptable risk to the environment based on the following:

- the reported concentrations are within a similar order of magnitude and/or only marginally in excess of the adopted criteria;
- groundwater beneath the site is not considered to be an ecological receptor of concern in itself; and
- the Mulwaree River is located approximately 570 m from the site boundary.

9.0 Conceptual site model

A conceptual site model is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. An understanding of potential exposure scenarios is necessary to evaluate the suitability of a site for a particular land use. Potential exposure pathways are evaluated for completeness based on the existence of:

- a source of contamination/impact;
- a mechanism for release of contaminants from identified sources;
- a contaminant retention or transport medium (e.g., soil, air, groundwater, etc.);
- potential receptors of contamination; and
- a mechanism for chemical intake by the receptors at the point of exposure (ingestion, dermal contact or inhalation or a combination of).

For exposure to be considered possible, a mechanism, i.e. pathway must exist by which contamination from a given source can reach a given receptor. Such complete source-pathway-receptor (SPR) exposure mechanisms are commonly termed SPR linkages. Pollutant sources, exposure mechanisms and receptors at the site are discussed in the following sections, with a thorough understanding of the relationships between each considered fundamental in assessing potential risk.

9.1 Sources of contamination

The potential and actual sources of soil and groundwater contamination for the site, and those which are considered to represent a potential environmental liability on-site are summarised below:

Actual sources

- **Lead and asbestos – Site infilling and waste disposal areas:** Fill material was reported to extend to depths of up to 2.5 m on-site, comprising spent coal ash and/or coal fragments, ACM and other buried waste material. Elevated concentrations of lead were reported to be widespread in fill material across the southern and north-western portion of the site. According to anecdotal information provided by GLRPS during the execution of this Additional ESA, the southern portion of the site was historically used as a scrapping / burning area for redundant timber railway carriages. It is understood that the construction of old railway carriages comprised of painted timber and rolled tin carriages with potential lead flashing.

ACM was identified to be widespread, both in and on soils across the southern and north-western portion of the site. A significant quantity of buried and layered ACM was identified in the southern portion of the site to depths greater than 2.2 m. Whilst the exact source of the ACM in and on soils remains unclear, it is likely associated with the inappropriate removal of ACM from the roof of the Roundhouse, demolition of the eastern portion of the Roundhouse and progressive removal of ACM from on-site structures. The extent of which is provided on Figure 5.

- **TRH in groundwater – Former diesel ASTs and refuelling gantry:** Current and historical dissolved phased petroleum hydrocarbon groundwater impacts have been reported within these areas, with the potential for historical leaks and spills as a result of historical operations.

Petroleum hydrocarbon concentrations in groundwater within the vicinity of the former refuelling gantry are limited in extent having been delineated by down gradient monitoring wells.

Potential sources

- **Current and historical operation of the Roundhouse building:** The site and Roundhouse building has a long history of industrial activities, with railway operations commencing in the early 1800's. The soil and groundwater contamination results from the following:
 - the current and historical application, use and storage of fuels, oils, solvents and degreasers;
 - the integrity of the locomotive maintenance pits / subterranean waste oil network and also stormwater drainage network, and how this potentially interacts remains unclear; and
 - current and historical general locomotive maintenance and machining activities.
- **Effluent treatment plant and oil/water separator(s):** The subterranean waste oil network historically connected the repair bays within the Roundhouse building to the effluent treatment plant and/or oil/water separator(s) via underground infrastructure. According to the J&K (1997), the entire drainage system was reported to be in poor condition and of questionable operation. As such, the integrity of all underground infrastructure is uncertain given the age of the facility and the presence of contaminants identified in soil and groundwater. These remain a potential source of contamination for the site.

9.2 Exposure and migration pathways

The pathways for potential contaminant migration and potential exposure to receptors are controlled by the geological environment, the built environment overlying the site and in adjacent areas, as well as physical separation distances between sources and potential receptors.

The considered pathways for potential soil and groundwater impact at this site include the following:

- exposure via dermal contact (incidental), ingestion (incidental) and/or inhalation (dust and/or vapour) of contaminated soils;
- migration and exposure of vapours from contaminated soils / groundwater and/or LNAPL;
- generation and pooling of ground gases that may present an explosive hazard;
- groundwater migration off-site or to an underlying aquifer;
- direct contact or ingestion of impacted groundwater;
- discharge of impacted groundwater to surface water bodies;
- groundwater migration to an underlying aquifer; and
- exposure to contaminated soils via plant root uptake.

The viability of these pathways is further assessed in Section 9.4.

The nearest registered groundwater abstraction well downgradient of the site is located approximately 689 m to the northeast of the operational areas, and area of TRH contamination. This groundwater plume has been generally delineated downgradient by a reduction in dissolved phase petroleum hydrocarbon groundwater concentrations observed in monitoring wells MW01 and concentrations below the laboratory limit of reporting in MW10, MW11 and MW12. Given this, and proximity to the nearest registered abstraction bore, a potentially complete SPR linkage through groundwater extraction is considered unlikely and has not been considered further in the CSM.

9.3 Receptors

The following potential receptors have been identified at the site:

Human receptors

- current and future on-site occupants in a commercial/industrial scenario on-site;
- current and future on-site excavation / intrusive maintenance workers; and
- potential users of groundwater for supply purposes.

Ecological receptors

- on-site terrestrial ecological receptors including soil processes, plant species and organisms that may inhabit or contact soils; and
- freshwater aquatic organisms off-site within the Mulwaree River.

9.4 Significant linkages

A source-pathway-receptor (SPR) linkage is considered to be present when a pathway links a source with a receptor. These linkages explain when there may be risks to the receptor, either now or in future.

All SPR linkages considered to be potentially complete are summarised in Table 9.1, below.

Table 9.1: Summary of Source-Pathway-Receptor linkages

Source	Pathway	Receptor(s)
Lead in soil – Fill material	Dermal contact, ingestion and/or dust inhalation	<ul style="list-style-type: none"> – on-site occupants in a commercial/industrial land use scenario. – on-site intrusive maintenance workers.
Asbestos in and on soil	Indoor / outdoor dust inhalation	<ul style="list-style-type: none"> – on-site occupants in a commercial/industrial land use scenario. – on-site intrusive maintenance workers.
TRH, copper, lead and zinc in soil – Fill material*	Ecological exposure, dermal contact, inhalation, ingestion and/or absorption.	<ul style="list-style-type: none"> – on-site terrestrial ecological receptors including on-site soil processes, plant species and organisms that may inhabit or contact soils.
Phenanthrene, chromium and zinc in groundwater.	Uptake / absorption of contaminated water	<ul style="list-style-type: none"> – Freshwater aquatic organisms off-site within the estuarine environment of Mulwaree River.

Notes: * Detailed Site Investigation (Cavvanba, 2021a)

Contaminated soils – human health

The uncovered lead contaminated surface soil provides a direct exposure pathway to site occupants and intrusive maintenance workers via dermal contact, dust inhalation or ingestion of contaminated soil. Elevated concentrations of lead were reported to be

widespread in fill material across the southern and north-western portion of the site which represents a potential risk to human health.

Non-friable ACM in and on soil provides a direct exposure pathway to on-site occupants and intrusive maintenance workers via airborne fibre inhalation if not appropriately managed. At depth the risk is reduced, however the area where highly concentrated ACM is buried at depth poses a high risk if the material is disturbed and should be treated as friable asbestos.

Contaminated soils – ecological

Copper, lead, zinc and / or TRH were reported to exceed the adopted ecological assessment criteria during the DSI (Cavvanba, 2021a). These criteria are designed for the protection of the upper 0 – 2 m of the soil profile, which corresponds to the root zone and habitation of many species. Given the highly disturbed nature of the site, presence of fill material and lack of vegetation and habitat for potential ecological receptors to exist, it is considered unlikely that a potentially complete SPR linkage exists. However, these exceedances should be considered in conjunction with human health criteria exceedances and assist with decision making regarding future site management and/or remediation.

Contaminated groundwater – Freshwater ecosystems

The presence of chromium, lead, zinc and/or and phenanthrene in groundwater provides a potential exposure pathway to off-site freshwater aquatic organisms through dermal contact, inhalation, ingestion and/or absorption of contaminated groundwater. However, given the absence of sensitive ecological receptors within the immediate vicinity and proximity of the site to the Mulwaree River (570 m), the presence of these contaminants in groundwater on-site are unlikely to represent an unacceptable risk to ecological receptors off-site.

Management limits / aesthetic issues

TRH concentrations in soil were reported to exceed the adopted management limits within the area of the former refuelling gantry and within the proximity to the Roundhouse building maintenance pits during the DSI (Cavvanba, 2021a). Whilst the magnitude of the reported concentrations are not considered to indicate the presence of LNAPL (CCME, 2008), the potential risk of hazardous atmospheres, aesthetic issues and effects on buried infrastructure, such as penetration of, or damage to in-ground services by hydrocarbons cannot be excluded.

9.5 Data gaps update

The continual refinement of the conceptual site model is facilitated through the identification and addressing of key data gaps. Any subsequent investigative efforts must focus on addressing the critical data gaps that remains in a manner that is proportional to the uncertainties identified and ensure the data collected is representative of the assessment area.

Based on Cavvanba's understanding of site conditions developed through information gathered to date, the following discussion is made regarding the outstanding data gaps:

- *Data Gap 1: TRH in groundwater.* The varying magnitude and trends of TRH in groundwater within the vicinity of the former diesel refuelling gantry and the Roundhouse where active maintenance is occurring are not well understood. There is some additional uncertainty regarding the two orders of magnitude reduction in dissolved phase petroleum hydrocarbons and presence of trihalomethanes in groundwater within monitoring well MW02. The presence of trihalomethanes is likely an indication of a potential potable water source / influence at this location.

Furthermore, there is some uncertainty regarding on-site waste management procedures and the integrity of the subterranean waste oil network.

- *Data Gap 2: Site infilling and waste disposal areas.* The nature and extent of buried waste material within the eastern and southern portion of the site has been established, sufficient to facilitate future remediation and/or management options for this area.
- *Data Gap 3: Asbestos in and on soil.* In the absence of an asbestos management plan for the site, the appropriate management of asbestos in soil remains unclear. There is sufficient information to facilitate future remediation and/or management options for ACM on-site.
- *Data Gap 4 – Site history.* The site has a long and complicated history with over 100 years of heavy industrial activity, and a change in site operations and management from approximately 1989 when the GLRPS acquired the lease. It is envisaged that this data gap will be progressively reconciled through the completion of additional monitoring and/or development of remediation / management options.

10.0 Conclusions and recommendations

Based on the scope of works completed, the objectives are considered to have been met and an increased understanding of contamination at the site has been established, sufficient to assist in addressing and closing data gaps previously identified and provide an updated assessment on potential risks to human health and/or the environment on and off-site.

In the context of the individual components completed and conceptual site model developed for the site, the following conclusions have been drawn:

Component 1 – TRH in groundwater

- There was no evidence of gross petroleum hydrocarbon contamination observed within soil during the delineation of the previously identified dissolved phase petroleum hydrocarbon impacts in groundwater within the vicinity of the former diesel refuelling gantry.
- Dissolved phase petroleum hydrocarbon contamination in groundwater in monitoring well MW02, located adjacent to the former refuelling gantry was reported two orders of magnitude below the previous groundwater monitoring event. Trihalomethanes, including chloroform and bromodichloromethane were also detected in groundwater at concentrations above the laboratory limit of reporting. The presence of these constituents is likely an indication of a potential potable water source / influence at this location.
- Petroleum hydrocarbon concentrations in monitoring well MW02, are limited in extent, having been delineated by a reduction in dissolved phase concentrations to the north, and absence of detectable petroleum hydrocarbon concentrations in existing and newly installed monitoring located down and cross-hydraulic gradient. However, some uncertainty remains regarding the two orders of magnitude reduction in contaminant concentrations and presence of trihalomethanes in groundwater.

Component 2 – Site infilling and waste disposal

- Lead was reported to exceed the health investigation level of 1,500 mg/kg at one location as part of this additional investigation. The lead exceedance was identified in fill material within the filled area located adjacent to the former workshop / machine shop in the southern portion of the site.
- Lead concentrations in soil were reported below the adopted health investigation level in all other samples collected from surficial soils and fill material collected as part of this investigation.
- Asbestos containing material was identified in one test pitting location as part of this additional investigation. Non-friable asbestos containing material was present within fill material from a depth of 1.7 m within the filled area adjacent to the former workshop / machine shop in the southern portion of the site.
- Potential asbestos containing material fragments were not identified within any other test pitting locations advanced as part of this investigation.

Component 3 – Groundwater monitoring

- The nature and extent of groundwater contamination at the site is summarised below:
 - evidence of LNAPL was not observed;

- groundwater analytical concentrations were reported below the applicable CRC CARE HSLs for vapour intrusion; and
- dissolved phase petroleum hydrocarbon impacts are limited in extent, having been delineated by monitoring wells on-site.

Through the development and continual refinement of the conceptual site model, potentially complete source-pathway-receptor linkages resulting in a potential risk to human health receptors under a commercial/industrial land use scenario have been identified which require further monitoring, remediation and/or appropriate management. These are discussed in Table 10.1, below.

Table 10.1: Data gaps summation and recommendations

Data Gaps summation	Recommendation
<p>1) <i>TRH in groundwater</i></p> <p>The varying magnitude and trends of TRH in groundwater within the vicinity of the former diesel refuelling gantry and the Roundhouse where active maintenance is occurring are not well understood. There is some additional uncertainty regarding the two orders of magnitude reduction in dissolved phase petroleum hydrocarbons and presence of trihalomethanes in groundwater within monitoring well MW02. Furthermore, there is some uncertainty regarding on-site waste management procedures and the integrity of the subterranean waste oil network.</p>	<p>Completion of a review of on-site waste management procedures and/or confirm the integrity of the subterranean waste oil network. Continue with a program of routine groundwater monitoring to:</p> <ul style="list-style-type: none"> - ensure that any changes in contaminant concentrations can be detected; - demonstrate plume stability, or otherwise; and - ensure the appropriate protection of groundwater human and ecological health.
<p>2) Site infilling and waste disposal areas</p> <p>The nature and extent of buried waste material within the eastern and southern portion of the site has been established, sufficient to facilitate future remediation and/or management options for this area.</p>	<p>Development of remediation and/or management options to ensure the protection of human and ecological health.</p>
<p>3) Asbestos in and on soil</p> <p>The nature and extent of ACM in and on soil has been established. There is sufficient information to facilitate future remediation and/or management options for ACM on-site.</p>	<p>Implement interim management measures as per <i>Interim Management Plan (Cavvanba, 2021c)</i>, and development of remediation and/or management options to ensure the appropriate protection of human health.</p>
<p>4) Site history</p> <p>The site has a long and complicated history with over 100 years of heavy industrial activity, and a change in site operations and management from approximately 1989 when the GLRPS acquired the lease. Some additional information has been obtained as part of this investigation.</p>	<p>It is envisaged that this data gap will be progressively reconciled through the completion of additional monitoring and/or development of remediation / management options.</p>

11.0 References

Previous Environmental Investigations

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Figures

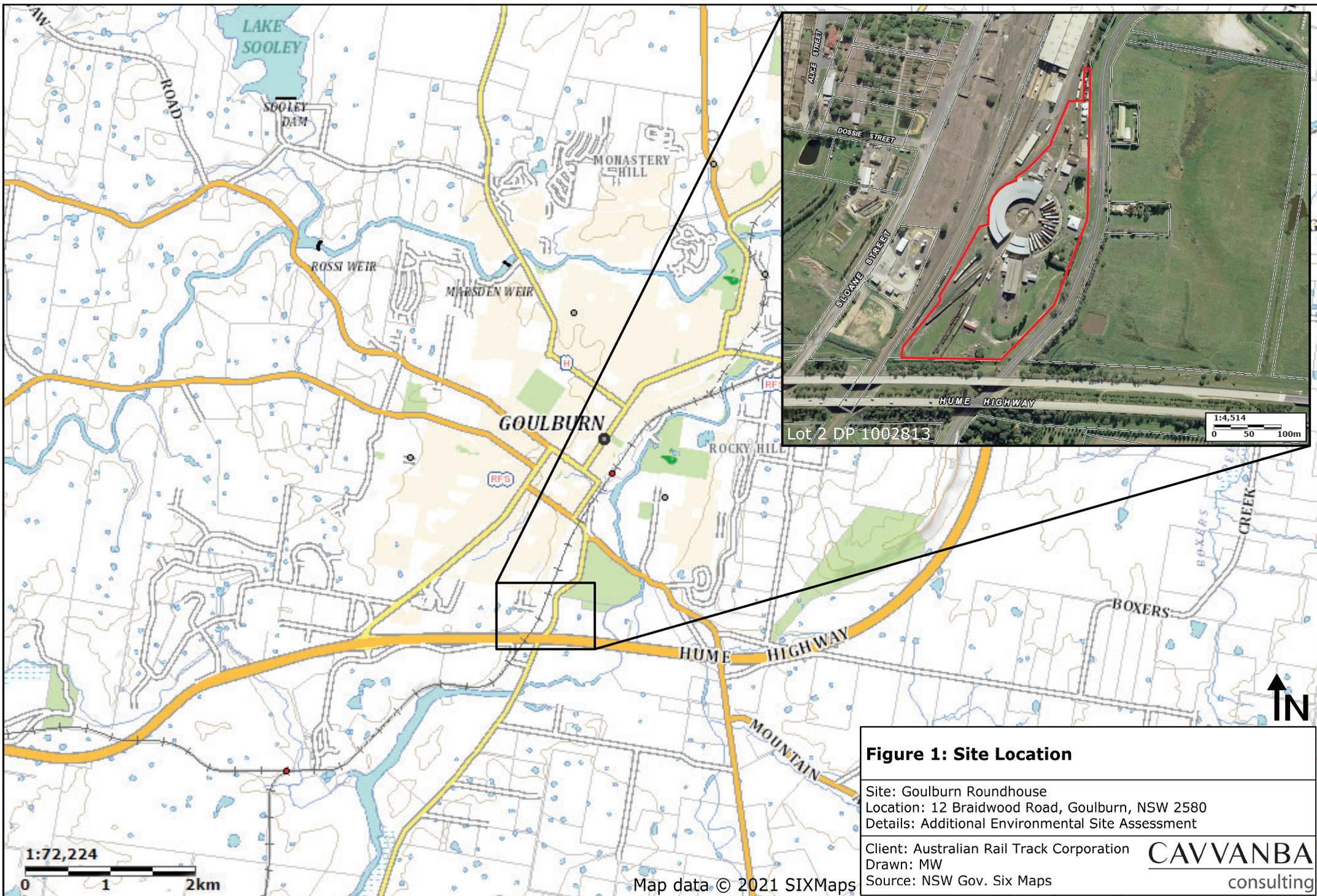


Figure 1: Site Location

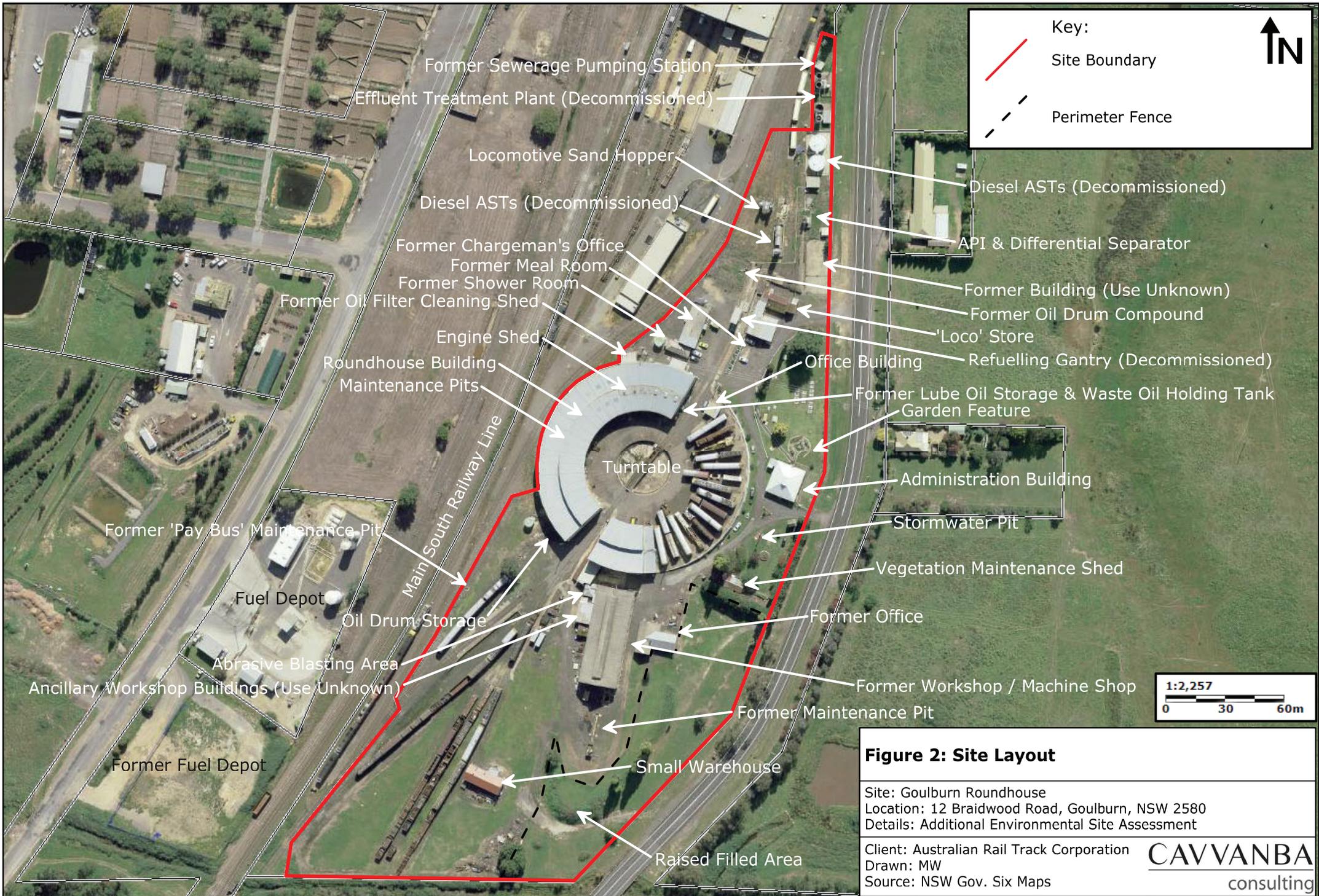
Site: Goulburn Roundhouse
 Location: 12 Braidwood Road, Goulburn, NSW 2580
 Details: Additional Environmental Site Assessment

Client: Australian Rail Track Corporation
 Drawn: MW
 Source: NSW Gov. Six Maps

CAVVANBA
 consulting

1:72,224
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Map data © 2021 SIXMaps



Former Sewerage Pumping Station

Effluent Treatment Plant (Decommissioned)

Locomotive Sand Hopper

Diesel ASTs (Decommissioned)

Former Chargeman's Office

Former Meal Room

Former Shower Room

Former Oil Filter Cleaning Shed

Engine Shed

Roundhouse Building

Maintenance Pits

Main South Railway Line

Turntable

Former 'Pay Bus' Maintenance Pit

Fuel Depot

Oil Drum Storage

Abrasive Blasting Area

Ancillary Workshop Buildings (Use Unknown)

Former Fuel Depot

Small Warehouse

Raised Filled Area

Key:

Site Boundary

Perimeter Fence



Diesel ASTs (Decommissioned)

API & Differential Separator

Former Building (Use Unknown)

Former Oil Drum Compound

'Loco' Store

Refuelling Gantry (Decommissioned)

Former Lube Oil Storage & Waste Oil Holding Tank

Garden Feature

Administration Building

Stormwater Pit

Vegetation Maintenance Shed

Former Office

Former Workshop / Machine Shop

Former Maintenance Pit

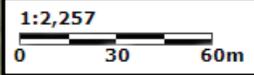
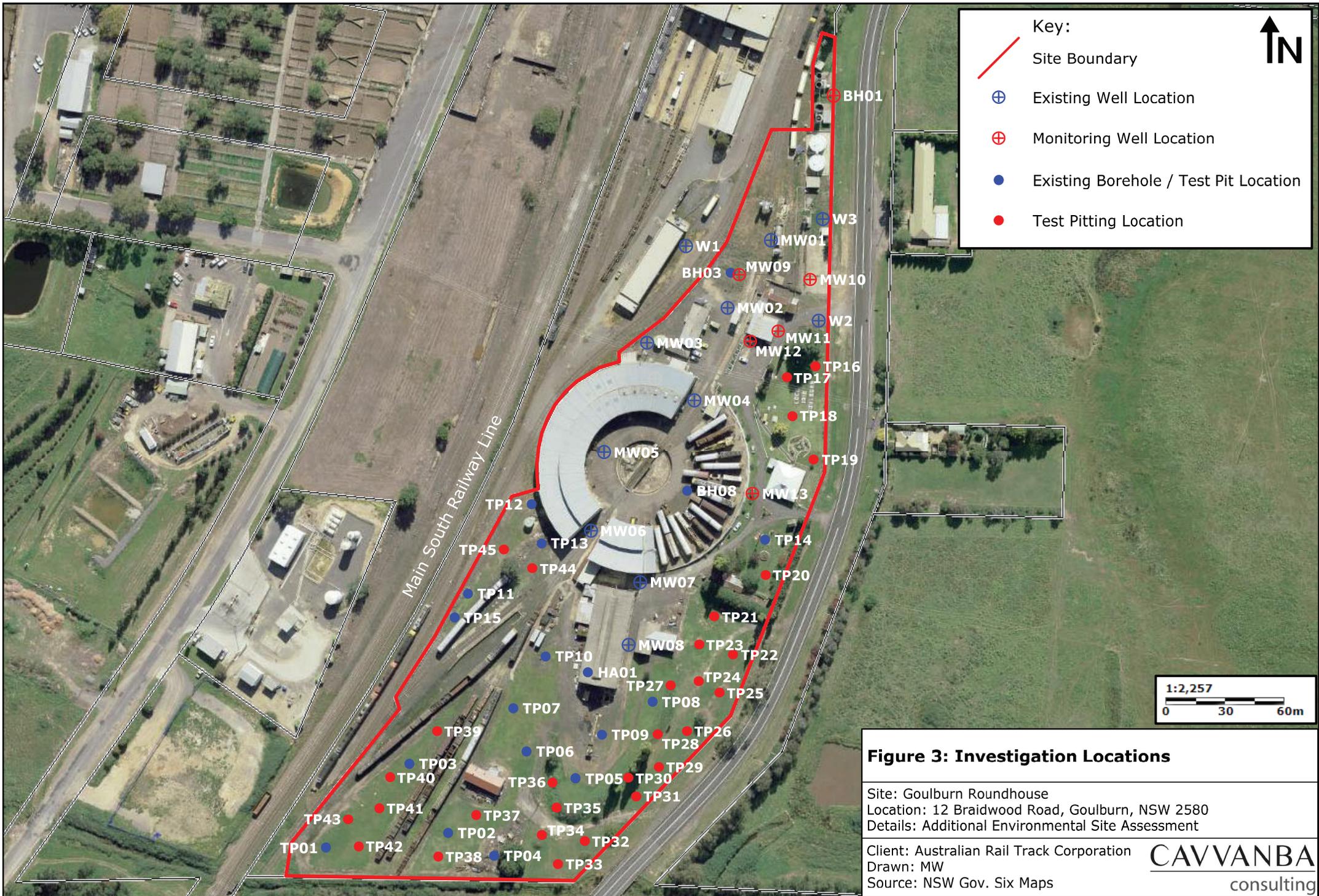


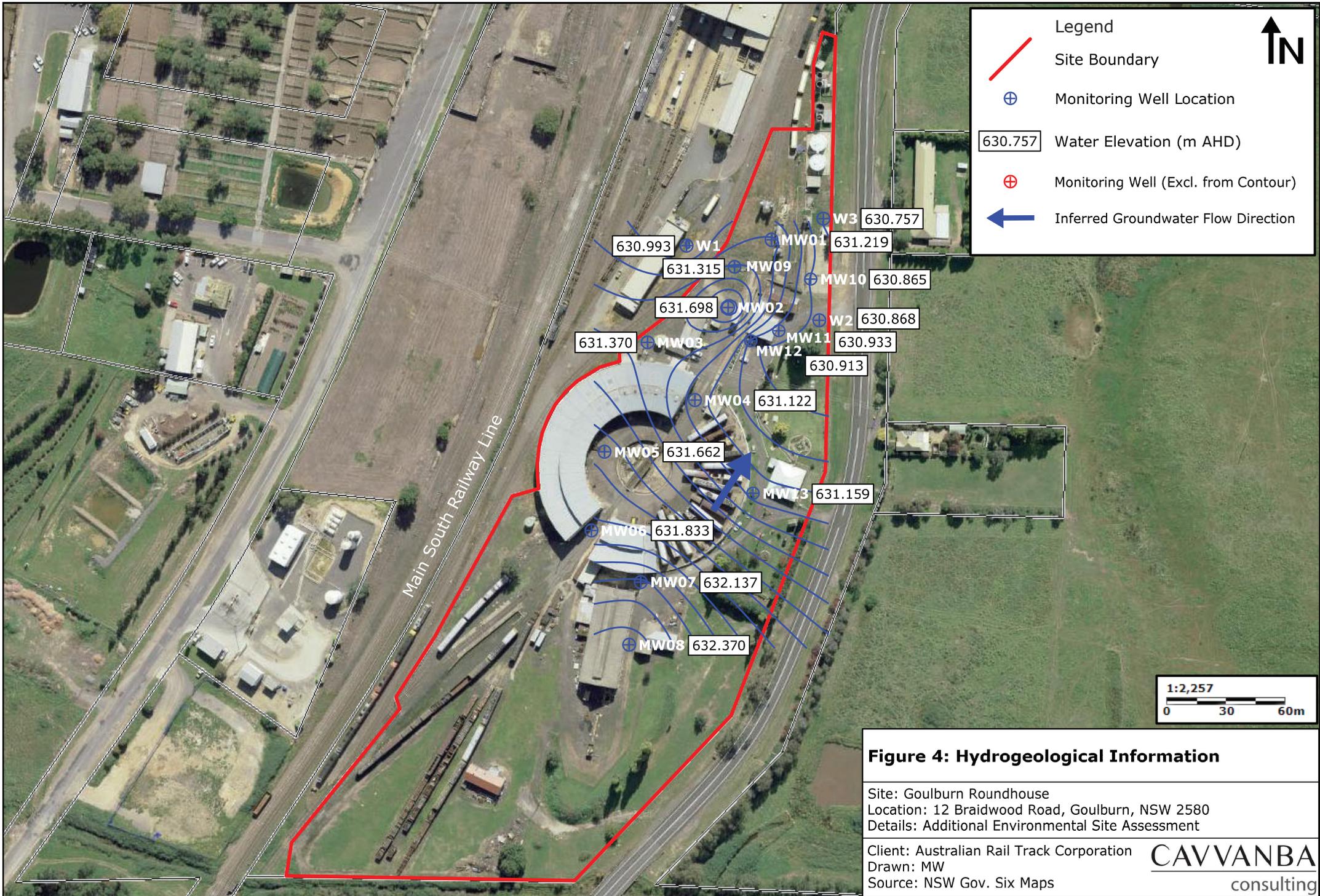
Figure 2: Site Layout

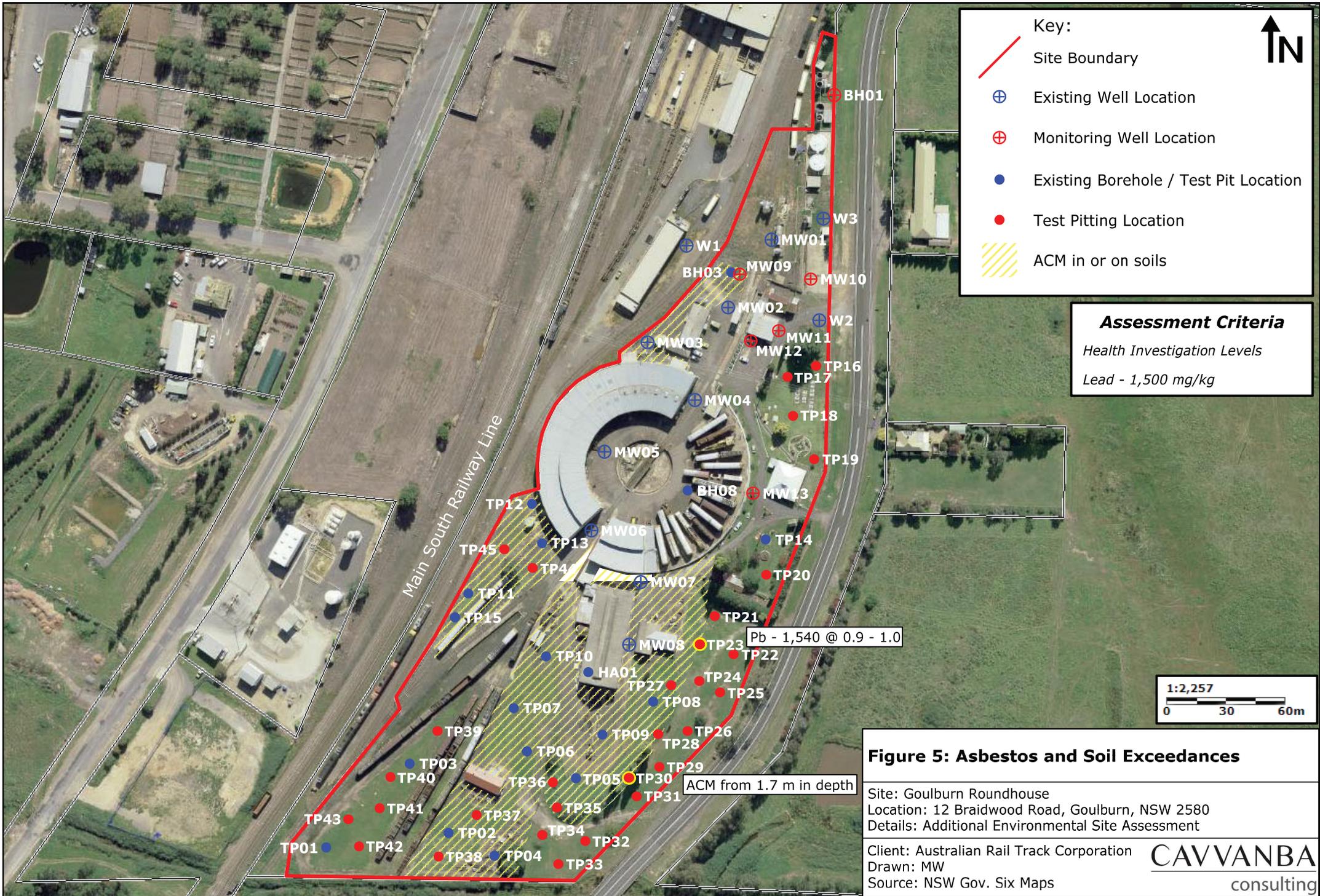
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 Details: Additional Environmental Site Assessment

Client: Australian Rail Track Corporation
 Drawn: MW
 Source: NSW Gov. Six Maps

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Tables

Table 1: Soil Analytical Summary - Sample Description and Analytical Summary

Sample	Depth (m)	Date sampled	Description	Analysis									
				Heavy metals	Lead	BTEX	TRH	PAHs	OCPs/OPPs				
<i>Soil Bores</i>													
MW09 0.0-0.05	0.0-0.05	09/06/21	Sandy GRAVEL / ASH, black, loose, dry, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted	•		•	•	•	•	•			
MW09 7.9-8.0	7.9-8.0	09/06/21	Gravelly CLAY, brown, medium plasticity / medium stiffness clay, moist, fine to coarse grained gravel, no hydrocarbon staining or odours noted	•		•	•	•	•	•			
MW10 6.9-7.0	6.9-7.0	09/06/21	Sandy CLAY, brown, medium plasticity / medium stiffness clay, fine to coarse grained sand, slight hydrocarbon odours, no staining noted	•		•	•	•	•	•			
MW10 7.9-8.0	7.9-8.0	09/06/21	Gravelly CLAY, brown, medium plasticity / medium stiffness clay, very moist, fine to coarse grained gravel, slight hydrocarbon odours, no staining noted	•		•	•	•	•	•			
MW11 0.05-0.1	0.05-0.1	08/06/21	Sandy GRAVEL, brown, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted	•		•	•	•	•	•			
MW11 8.9-9.0	8.9-9.0	08/06/21	Gravelly CLAY, brown, medium plasticity / medium stiffness clay, moist, fine to coarse grained gravel, no hydrocarbon staining or odours noted	•		•	•	•	•	•			
MW12 0.0-0.05	0.0-0.05	08/06/21	Clayey Sandy GRAVEL, black / brown, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted	•		•	•	•	•	•			
MW12 7.9-8.0	7.9-8.0	08/06/21	Gravelly CLAY, brown, medium plasticity / medium stiffness clay, moist, fine to coarse grained gravel, no hydrocarbon staining or odours noted	•		•	•	•	•	•			
MW13 0.0-0.05	0.0-0.05	08/06/21	Clayey Sandy GRAVEL / ASH, black / brown, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted	•		•	•	•	•	•			
MW13 4.9-5.0	4.9-5.0	08/06/21	Gravelly CLAY, brown, medium plasticity / medium stiffness clay, slightly moist, fine to coarse grained gravel, no hydrocarbon staining or odours noted	•		•	•	•	•	•			
<i>Test Pits</i>													
TP16 0.0-0.05	0.0-0.05	06/07/21	Silty CLAY, dark brown, slightly moist, low plasticity / soft clay, no hydrocarbon odour or staining		•								
TP16 0.3-0.4	0.3-0.4	06/07/21	Sandy GRAVEL / ASH, black, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		•								
TP17 0.0-0.05	0.0-0.05	06/07/21	Silty CLAY, dark brown, slightly moist, low plasticity / soft clay, no hydrocarbon odour or staining		•								
TP18 0.0-0.05	0.0-0.05	06/07/21	Silty CLAY, dark brown, slightly moist, low plasticity / soft clay, no hydrocarbon odour or staining		•								
TP18 0.9-1.0	0.9-1.0	06/07/21	Sandy CLAY, light brown, low plasticity / soft clay, slightly moist, fine to coarse grained sand, no hydrocarbon staining or odours noted		•								
TP19 0.0-0.05	0.0-0.05	06/07/21	Silty CLAY, dark brown, slightly moist, low plasticity / soft clay, no hydrocarbon odour or staining		•								
TP19 0.4-0.5	0.4-0.5	06/07/21	Clayey Sandy GRAVEL, brown / black, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		•								
TP20 0.0-0.05	0.0-0.05	06/07/21	Silty CLAY, dark brown, slightly moist, low plasticity / soft clay, no hydrocarbon odour or staining		•								
TP21 0.0-0.05	0.0-0.05	06/07/21	Clayey Sandy GRAVEL, light brown, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		•								
TP21 0.9-1.0	0.9-1.0	06/07/21	Sandy GRAVEL / ASH, black, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		•								
TP22 0.0-0.05	0.0-0.05	06/07/21	Sandy GRAVEL / ASH, black, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		•								
TP23 0.0-0.05	0.0-0.05	06/07/21	Clayey Sandy GRAVEL, brown, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		•								
TP23 0.9-1.0	0.9-1.0	06/07/21	Sandy GRAVEL, black / grey, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		•								
TP24 0.0-0.05	0.0-0.05	06/07/21	Clayey Sandy GRAVEL, brown, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		•								
TP25 0.0-0.05	0.0-0.05	06/07/21	Clayey SAND / ASH, black, loose, slightly moist, fine to coarse grained sand, no hydrocarbon staining or odours noted		•								
TP25 0.4-0.5	0.4-0.5	06/07/21	Silty CLAY, brown, slightly moist, low plasticity / soft clay, no hydrocarbon odour or staining		•								
TP26 0.0-0.05	0.0-0.05	06/07/21	Clayey SAND, black, loose, slightly moist, fine to coarse grained sand, no hydrocarbon staining or odours noted		•								
TP27 0.0-0.05	0.0-0.05	06/07/21	Clayey Sandy GRAVEL, brown / black, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		•								
TP27 0.4-0.5	0.4-0.5	06/07/21	Sandy GRAVEL / ASH, black, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		•								

Table 1: Soil Analytical Summary - Sample Description and Analytical Summary

Sample	Depth (m)	Date sampled	Description	Analysis					
				Heavy metals	Lead	BTEX	TRH	PAHs	OCPs/OPPs
TP28 0.0-0.05	0.0-0.05	06/07/21	Clayey SAND, black, loose, slightly moist, fine to coarse grained sand, no hydrocarbon staining or odours noted		.				
TP28 0.9-1.0	0.9-1.0	06/07/21	Sandy CLAY, light brown, low plasticity / medium stiff clay, slightly moist, fine to coarse grained sand, no hydrocarbon staining or odours noted		.				
TP29 0.0-0.05	0.0-0.05	06/07/21	Clayey SAND, black, loose, slightly moist, fine to coarse grained sand, no hydrocarbon staining or odours noted		.				
TP29 0.4-0.5	0.4-0.5	06/07/21	Silty CLAY, brown, slightly moist, low plasticity / soft clay, no hydrocarbon odour or staining		.				
TP30 0.0-0.05	0.0-0.05	06/07/21	Clayey Sandy GRAVEL, brown, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		.				
TP30 1.4-1.5	1.4-1.5	06/07/21	Sandy GRAVEL / ASH, black, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		.				
TP31 0.0-0.05	0.0-0.05	06/07/21	Clayey SAND, black, loose, slightly moist, fine to coarse grained sand, no hydrocarbon staining or odours noted		.				
TP32 0.0-0.05	0.0-0.05	06/07/21	Clayey SAND, black, loose, slightly moist, fine to coarse grained sand, no hydrocarbon staining or odours noted		.				
TP33 0.0-0.05	0.0-0.05	06/07/21	Gravelly Sandy CLAY, dark brown / black, slightly moist, low plasticity / soft clay, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		.				
TP33 0.4-0.5	0.4-0.5	06/07/21	Silty CLAY, brown, slightly moist, low plasticity / soft clay, no hydrocarbon odour or staining		.				
TP34 0.0-0.05	0.0-0.05	06/07/21	Clayey Sandy GRAVEL, brown, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		.				
TP34 0.4-0.5	0.4-0.5	06/07/21	Sandy GRAVEL / ASH, black, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		.				
TP35 0.0-0.05	0.0-0.05	06/07/21	Clayey Sandy GRAVEL, brown / black, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		.				
TP35 0.4-0.5	0.4-0.5	06/07/21	Clayey Sandy GRAVEL, brown / black, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		.				
TP36 0.0-0.05	0.0-0.05	06/07/21	Clayey Sandy GRAVEL, brown / black, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		.				
TP36 0.9-1.0	0.9-1.0	06/07/21	Clayey Sandy GRAVEL, brown / black, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		.				
TP37 0.0-0.05	0.0-0.05	07/07/21	Sandy GRAVEL, black / brown, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		.				
TP38 0.0-0.05	0.0-0.05	07/07/21	Sandy GRAVEL, black / brown, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		.				
TP39 0.0-0.05	0.0-0.05	07/07/21	Sandy GRAVEL, black / brown, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		.				
TP39 0.3-0.4	0.3-0.4	07/07/21	Silty CLAY, brown, slightly moist, low plasticity / soft clay, no hydrocarbon odour or staining		.				
TP40 0.0-0.05	0.0-0.05	07/07/21	Sandy GRAVEL / ASH, black, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		.				
TP41 0.0-0.05	0.0-0.05	07/07/21	Silty CLAY, brown, slightly moist, low plasticity / soft clay, no hydrocarbon odour or staining		.				
TP42 0.0-0.05	0.0-0.05	07/07/21	Clayey Sandy GRAVEL, brown, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		.				
TP42 0.4-0.5	0.4-0.5	07/07/21	Sandy GRAVEL / ASH, black, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		.				
TP43 0.0-0.05	0.0-0.05	07/07/21	Sandy GRAVEL, black, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		.				
TP43 0.9-1.0	0.9-1.0	07/07/21	Silty CLAY, brown, slightly moist, low plasticity / soft clay, no hydrocarbon odour or staining		.				
TP44 0.0-0.05	0.0-0.05	07/07/21	Sandy GRAVEL, black, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		.				
TP44 0.4-0.5	0.4-0.5	07/07/21	Sandy GRAVEL / ASH, black, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		.				
TP45 0.0-0.05	0.0-0.05	07/07/21	Sandy GRAVEL, black, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		.				
TP45 0.2-0.3	0.2-0.3	07/07/21	Sandy GRAVEL, black, loose, slightly moist, fine to coarse grained sand / gravel, no hydrocarbon staining or odours noted		.				

Table 2: Soil Analytical Summary - Heavy Metals (mg/kg)

Sample	Depth (m)	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Mercury
LOR		5	1	2	5	5	2	5	0.1
<i>Analytical - Soil Bores</i>									
MW09 0.0-0.05	0.0-0.05	40	nd	15	93	144	10	320	nd
MW09 7.9-8.0	7.9-8.0	nd	nd	22	15	10	11	14	nd
MW10 6.9-7.0	6.9-7.0	nd	nd	44	20	23	20	6	nd
MW10 7.9-8.0	7.9-8.0	nd	nd	44	21	27	23	8	nd
MW11 0.05-0.1	0.05-0.1	nd	nd	29	18	17	8	7	nd
MW11 8.9-9.0	8.9-9.0	nd	nd	18	10	12	10	8	nd
MW12 0.0-0.05	0.0-0.05	nd	nd	23	150	330	8	341	nd
MW12 7.9-8.0	7.9-8.0	nd	nd	11	9	7	9	nd	nd
MW13 0.0-0.05	0.0-0.05	9	nd	37	<u>1,050</u>	1,120	10	135	0.4
MW13 4.9-5.0	4.9-5.0	nd	nd	24	15	18	14	6	nd
<i>Analytical - Test Pits</i>									
TP16 0.0-0.05	0.0-0.05	-	-	-	-	104	-	-	-
TP16 0.3-0.4	0.3-0.4	-	-	-	-	396	-	-	-
TP17 0.0-0.05	0.0-0.05	-	-	-	-	186	-	-	-
TP18 0.0-0.05	0.0-0.05	-	-	-	-	168	-	-	-
TP18 0.9-1.0	0.9-1.0	-	-	-	-	38	-	-	-
TP19 0.0-0.05	0.0-0.05	-	-	-	-	236	-	-	-
TP19 0.4-0.5	0.4-0.5	-	-	-	-	443	-	-	-
TP20 0.0-0.05	0.0-0.05	-	-	-	-	329	-	-	-
TP21 0.0-0.05	0.0-0.05	-	-	-	-	131	-	-	-
TP21 0.4-0.5	0.4-0.5	-	-	-	-	1,270	-	-	-
TP21 0.9-1.0	0.9-1.0	-	-	-	-	89	-	-	-
TP22 0.0-0.05	0.0-0.05	-	-	-	-	426	-	-	-
TP22 0.3-0.4	0.3-0.4	-	-	-	-	11	-	-	-
TP23 0.0-0.05	0.0-0.05	-	-	-	-	226	-	-	-
TP23 0.9-1.0	0.9-1.0	-	-	-	-	1,540	-	-	-
TP23 1.9-2.0	1.9-2.0	-	-	-	-	9	-	-	-
TP24 0.0-0.05	0.0-0.05	-	-	-	-	62	-	-	-
TP25 0.0-0.05	0.0-0.05	-	-	-	-	700	-	-	-
TP25 0.4-0.5	0.4-0.5	-	-	-	-	16	-	-	-
TP26 0.0-0.05	0.0-0.05	-	-	-	-	468	-	-	-
TP27 0.0-0.05	0.0-0.05	-	-	-	-	275	-	-	-
TP27 0.4-0.5	0.4-0.5	-	-	-	-	1,040	-	-	-
TP28 0.0-0.05	0.0-0.05	-	-	-	-	194	-	-	-
TP28 0.9-1.0	0.9-1.0	-	-	-	-	61	-	-	-
TP29 0.0-0.05	0.0-0.05	-	-	-	-	269	-	-	-
TP29 0.4-0.5	0.4-0.5	-	-	-	-	25	-	-	-
TP30 0.0-0.05	0.0-0.05	-	-	-	-	32	-	-	-
TP30 1.4-1.5	1.4-1.5	-	-	-	-	85	-	-	-
TP31 0.0-0.05	0.0-0.05	-	-	-	-	882	-	-	-
TP31 0.4-0.5	0.4-0.5	-	-	-	-	30	-	-	-
TP32 0.0-0.05	0.0-0.05	-	-	-	-	152	-	-	-
TP33 0.0-0.05	0.0-0.05	-	-	-	-	118	-	-	-
TP33 0.4-0.5	0.4-0.5	-	-	-	-	36	-	-	-
TP34 0.0-0.05	0.0-0.05	-	-	-	-	500	-	-	-
TP34 0.4-0.5	0.4-0.5	-	-	-	-	506	-	-	-
TP35 0.0-0.05	0.0-0.05	-	-	-	-	235	-	-	-
TP35 0.4-0.5	0.4-0.5	-	-	-	-	272	-	-	-
TP36 0.0-0.05	0.0-0.05	-	-	-	-	247	-	-	-
TP36 0.9-1.0	0.9-1.0	-	-	-	-	85	-	-	-
TP37 0.0-0.05	0.0-0.05	-	-	-	-	742	-	-	-
TP37 0.4-0.5	0.4-0.5	-	-	-	-	24	-	-	-
TP38 0.0-0.05	0.0-0.05	-	-	-	-	18	-	-	-
TP39 0.0-0.05	0.0-0.05	-	-	-	-	229	-	-	-
TP39 0.3-0.4	0.3-0.4	-	-	-	-	90	-	-	-
TP40 0.0-0.05	0.0-0.05	-	-	-	-	329	-	-	-
TP41 0.0-0.05	0.0-0.05	-	-	-	-	72	-	-	-
TP42 0.0-0.05	0.0-0.05	-	-	-	-	124	-	-	-
TP42 0.4-0.5	0.4-0.5	-	-	-	-	157	-	-	-
TP43 0.0-0.05	0.0-0.05	-	-	-	-	148	-	-	-
TP43 0.9-1.0	0.9-1.0	-	-	-	-	24	-	-	-
TP44 0.0-0.05	0.0-0.05	-	-	-	-	360	-	-	-
TP44 0.4-0.5	0.4-0.5	-	-	-	-	353	-	-	-
TP44 0.6-0.7	0.6-0.7	-	-	-	-	21	-	-	-
TP45 0.0-0.05	0.0-0.05	-	-	-	-	164	-	-	-
TP45 0.2-0.3	0.2-0.3	-	-	-	-	33	-	-	-
<i>Statistics</i>									
Samples analysed		10	10	10	10	65	10	10	10
Detects		2	0	10	10	65	10	9	1
% detect		20%	0%	100%	100%	100%	100%	90%	10%
Maximum		40	<1	44	<u>1,050</u>	1,540	23	341	0.4
Mean		25	<1	27	140	254	12	94	0.4
Median		25	<1	24	19	148	10	8	0.4
Minimum		<5	<1	11	9	7	8	6	<0.1
<i>Criteria</i>									
HILs - Commercial / Industrial D		3,000	900	3,600	240,000	1,500	6,000	400,000	730/180
EILs - Commercial and Industrial (Aged)		160	-	1,000	<u>300</u>	1,800	310	740	-

Table 3: Soil Analytical Summary - TRH and BTEXN (mg/kg)

Sample	Depth (m)	Benzene	Toluene	Ethyl benzene	meta- & para-Xylenes	ortho-Xylene	Naphthalene	F1 TRH C ₆ - C ₁₀	F2 TRH >C ₁₀ - C ₁₆	F3 TRH >C ₁₆ - C ₃₄	F4 TRH >C ₃₄ - C ₄₀
LOR		0.2	0.5	0.5	0.5	0.5	0.5	10	50	100	100
<i>Analytical - Soil Bores</i>											
MW09 0.0-0.05	0.0-0.05	nd	nd	nd	1.8	0.7	nd	nd	nd	150	nd
MW09 7.9-8.0	7.9-8.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW10 6.9-7.0	6.9-7.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW10 7.9-8.0	7.9-8.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW11 0.05-0.1	0.05-0.1	nd	nd	nd	nd	nd	nd	nd	nd	160	180
MW11 8.9-9.0	8.9-9.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW12 0.0-0.05	0.0-0.05	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW12 7.9-8.0	7.9-8.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW13 0.0-0.05	0.0-0.05	nd	nd	nd	nd	nd	nd	nd	nd	120	nd
MW13 4.9-5.0	4.9-5.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
<i>Statistics</i>											
Samples analysed		10	10	10	10	10	10	10	10	10	10
Detects		0	0	0	1	1	0	0	0	3	1
% detect		0%	0%	0%	10%	10%	0%	0%	0%	30%	10%
Maximum		<0.2	<0.5	<0.5	1.8	0.7	<0.5	<10	<50	160	180
Mean		<0.2	<0.5	<0.5	1.8	0.7	<0.5	<10	<50	143	180
Median		<0.2	<0.5	<0.5	1.8	0.7	<0.5	<10	<50	150	180
Minimum		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<50	<100	<100
<i>Criteria - Commercial / Industrial (Clay)</i>											
HSL D - 0 m to < 1 m		4	NL	NL	NL	NL	NL	310	NL	NL	NL
HSL D - 1 m to < 2 m		6	NL	NL	NL	NL	NL	480	NL	NL	NL
HSL D - 2 m to < 4 m		9	NL	NL	NL	NL	NL	NL	NL	NL	NL
HSL D - 4 m+		20	NL	NL	NL	NL	NL	NL	NL	NL	NL
HILs - Commercial / Industrial D		-	-	-	-	-	-	-	-	-	-
Ecological - Commercial / Industrial (Aged)		75	135	165	180	370	215	170	1,700	3,300	
Management Limits - Commercial and Industrial		-	-	-	-	-	-	1,000	3,500	10,000	
HSL D - Direct Contact		430	99,000	27,000	81,000	-	26,000	20,000	27,000	38,000	
Intrusive Maintenance Worker - Direct Contact		1,100	120,000	85,000	130,000	29,000	82,000	62,000	85,000	120,000	
Intrusive Maintenance Worker - Shallow Trench - 0 m to < 2 m		350	NL	NL	NL	NL	NL	NL	NL	NL	
Intrusive Maintenance Worker - Shallow Trench - 2 m to < 4 m		NL	NL	NL	NL	NL	NL	NL	NL	NL	
Intrusive Maintenance Worker - Shallow Trench - 4 m+		NL	NL	NL	NL	NL	NL	NL	NL	NL	

Table 4: Soil Analytical Summary - PAHs (mg/kg)

Sample	Depth (m)	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1.2.3.cd)pyrene	Dibenz(a,h)anthracene	Benzo(g,h,i)perylene	Total PAHs	B(a)P TEQ
<i>LORs</i>		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
<i>Analytical - Soil Bores</i>																			
MW09 0.0-0.05	0.0-0.05	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW09 7.9-8.0	7.9-8.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW10 6.9-7.0	6.9-7.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW10 7.9-8.0	7.9-8.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW11 0.05-0.1	0.05-0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW11 8.9-9.0	8.9-9.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW12 0.0-0.05	0.0-0.05	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW12 7.9-8.0	7.9-8.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW13 0.0-0.05	0.0-0.05	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW13 4.9-5.0	4.9-5.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
<i>Statistics</i>																			
Samples analysed		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Detects		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% detect		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%	0%	0%	0%	0%
Maximum		<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
Mean		<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
Median		<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
Minimum		<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
<i>Criteria</i>																			
HILs - Commercial / Industrial D		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4,000
EILs - Commercial / Industrial (Aged)		370	-	-	-	-	-	-	-	-	-	-	-	1.4	-	-	-	-	-

Table 5: Soil Analytical Summary - OCPs, OPPs and PCBs (mg/kg)

Sample	Depth (m)	OCPs							PCBs	OPPs
		Heptachlor	Total Chlordane (sum)	Endrin	Endosulfan (sum)	Methoxychlor	Sum of Aldrin + Dieldrin	Sum of DDD + DDE + DDT	Total Polychlorinated biphenyls	Chloropyrifos
<i>LORs</i>		0.2	0.1	0.05	0.05	0.2	0.05	0.05	0.1	0.1
<i>Analytical - Soil Bores</i>										
MW09 0.0-0.05	0.0-0.05	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW09 7.9-8.0	7.9-8.0	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW10 6.9-7.0	6.9-7.0	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW10 7.9-8.0	7.9-8.0	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW11 0.05-0.1	0.05-0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW11 8.9-9.0	8.9-9.0	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW12 0.0-0.05	0.0-0.05	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW12 7.9-8.0	7.9-8.0	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW13 0.0-0.05	0.0-0.05	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW13 4.9-5.0	4.9-5.0	nd	nd	nd	nd	nd	nd	nd	nd	nd
<i>Statistics</i>										
Samples analysed		10	10	10	10	10	10	10	10	10
Detects		0	0	0	0	0	0	0	0	0
% detect		0%	0%	0%	0%	0%	0%	0%	0%	0%
Maximum		<0.2	<0.1	<0.05	<0.05	<0.2	<0.05	<0.05	<0.1	<0.05
Mean		<0.2	<0.1	<0.05	<0.05	<0.2	<0.05	<0.05	<0.1	<0.05
Median		<0.2	<0.1	<0.05	<0.05	<0.2	<0.05	<0.05	<0.1	<0.05
Minimum		<0.2	<0.1	<0.05	<0.05	<0.2	<0.05	<0.05	<0.1	<0.05
<i>Criteria</i>										
HILs - Commercial / Industrial D		50	530	100	2,000	2,500	45	3,600	7	2,000
EILs - Commercial and Industrial (Aged)		-	-	-	-	-	-	640 (DDT only)	-	-

Table 6: Soil Analytical Summary - Asbestos

Sample	Field observations	Asbestos detected in laboratory sample?	Asbestos Type Laboratory result	Classification - AF or ACM Based on laboratory & field assessment
ACM01	Cement sheeting fragment identified within TP30 at 1.7 metres in depth	Yes	Chrysotile	ACM

Table 7a: Soil Analytical Summary - Quality Control (mg/kg)

Analyte	LOR mg/kg	MW12 0.0- 0.05	QS01	RPD	MW12 0.0- 0.05	QS02	RPD	Trip Blank	Trip Spike	Trip Spike	Trip Spike
<i>Type</i>	-	<i>Primary</i>	<i>Intralab Duplicate</i>	%	<i>Primary</i>	<i>Interlab Duplicate</i>	%	<i>Lab prep</i>	<i>Field</i>	<i>Lab</i>	<i>Recovery</i>
<i>Date</i>	-	08/06/21	08/06/21	-	08/06/21	08/06/21	-	09/06/21	09/06/21	09/06/21	-
<i>Media</i>	<i>Soil</i>	<i>Soil</i>	<i>Soil</i>	-	<i>Soil</i>	<i>Soil</i>	-	<i>Soil</i>	<i>Soil</i>	<i>Soil</i>	
<i>Heavy metals</i>											
Arsenic	5	nd	6	-	nd	16	-	-	-	-	-
Cadmium	1	nd	nd	-	nd	0.6	-	-	-	-	-
Chromium	2	23	18	24	23	39	52	-	-	-	-
Copper	5	150	263	55	150	180	18	-	-	-	-
Lead	5	330	325	2	330	250	28	-	-	-	-
Nickel	2	8	8	0	8	19	81	-	-	-	-
Zinc	5	341	277	21	341	400	16	-	-	-	-
Mercury	0.1	nd	nd	-	nd	< 0.1	-	-	-	-	-
<i>Organics</i>											
Benzene	0.2	nd	nd	-	nd	nd	-	nd	nd	nd	-
Toluene	0.5	nd	nd	-	nd	nd	-	nd	6.2	8.1	77
Ethyl benzene	0.5	nd	nd	-	nd	nd	-	nd	1.3	1.7	76
meta- & para-Xylene	0.5	nd	nd	-	nd	nd	-	nd	6.9	9	77
ortho-Xylene	0.5	nd	nd	-	nd	nd	-	nd	3	4	75
F1 TRH C ₆ - C ₁₀	10	nd	nd	-	nd	nd	-	nd	18	23	78
F2 TRH >C ₁₀ - C ₁₆	50	nd	nd	-	nd	nd	-	-	-	-	-
F3 TRH >C ₁₆ - C ₃₄	100	nd	nd	-	nd	83	-	-	-	-	-
F4 TRH >C ₃₄ - C ₄₀	100	nd	nd	-	nd	80	-	-	-	-	-
Sum PAHs	0.5	nd	nd	-	nd	nd	-	-	-	-	-
<i>Data Quality Indicator</i>		-	-	<50%	-	-	<50%	-	-	-	70-130%

Table 7b: Soil Analytical Summary - Quality Control (mg/kg)

Analyte	LOR mg/kg	TP23 0.0-0.05	QS01	RPD	TP23 0.0-0.05	QS02	RPD	TP28 0.0-0.05	QS03	RPD	TP28 0.0-0.05	QS04	RPD	TP16 0.0-0.05	QS05	RPD	TP16 0.0-0.05	QS06	RPD	Trip Blank	Trip Spike	Trip Spike	Trip Spike
Type	-	Primary	Intralab Duplicate	%	Primary	Interlab Duplicate	%	Primary	Intralab Duplicate	%	Primary	Interlab Duplicate	%	Primary	Intralab Duplicate	%	Primary	Interlab Duplicate	%	Lab prep	Field	Lab	Recovery
Date	-	06/07/21	06/07/21	-	06/07/21	06/07/21	-	06/07/21	06/07/21	-	06/07/21	06/07/21	-	06/07/21	06/07/21	-	06/07/21	06/07/21	-	08/07/21	05/07/21	05/07/21	-
Media	Soil	Soil	Soil	-	Soil	Soil	Soil																
<i>Heavy metals</i>																							
Lead	5	226	333	38	226	280	21	194	278	36	194	240	21	104	107	3	104	100	4	-	-	-	-
<i>Organics</i>																							
Benzene	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	nd	nd	nd	-
Toluene	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	nd	12.8	15	85
Ethyl benzene	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	nd	2.3	2.7	85
meta- & para-Xylene	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	nd	11.4	13.1	87
ortho-Xylene	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	nd	4.8	5.2	92
F1 TRH C ₆ - C ₁₀	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	nd	-	-	-
F2 TRH >C ₁₀ - C ₁₆	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3 TRH >C ₁₆ - C ₃₄	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F4 TRH >C ₃₄ - C ₄₀	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sum PAHs	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Data Quality Indicator		-	-	<50%	-	-	<50%	-	-	<50%	-	-	<50%	-	-	<50%	-	-	<50%	-	-	-	70-130%

Soil Analytical Summary Table Notes

LOR denotes limit of reporting (standard LOR unless otherwise shown)

nd denotes not detected above the LOR

NL denotes non-limiting

- denotes not analysed/not available

Bold - Exceeds landuse criteria

RPD denotes relative percent difference

^ denotes raised LOR

TRH C₆-C₁₀ F1 = TRH C₆-C₁₀ minus BTEX compounds

HSL for VI = Health Screening Levels for Vapour Intrusion

Management limits = Petroleum hydrocarbon management limits (ASC NEPM (2013))

HSLs for direct contact = CRC CARE (2011)

ESL = Ecological Screening Levels

EIL = Ecological Investigation Levels (ASC NEPM (2013))

*analyte list shown on laboratory report

1. Methyl mercury / inorganic mercury

EILs calculated based on a pH of 8.4, Electrical Conductivity of 111 µS/cm, Cation Exchange Capacity = 10.8 meq/100g, Total Organic Carbon = 0.28%, Clay content = 34%

Table 8: Groundwater Monitoring Well Construction Details

Well ID	Date of Installation	Top of Well Casing Elevation (m AHD)	Bottom of Well Depth (m)	Top of Well Screen (m)	Bottom of Well Screen (m)	Location (MGA)		Initial Water Strike	Initial Groundwater level	Lithology of screened selection
						Easting	Northing			
W1	28/05/1997	637.330	12.0	9.0	12.0	-	-	11.0	7.207	Silty Clay
W2	28/05/1997	636.230	10.5	7.5	10.5	-	-	10.0	6.212	Silty Clay
W3	28/05/1997	635.810	9.0	6.0	9.0	-	-	8.5	5.825	Silty Clay
MW01	19/08/2020	637.670	9.0	5.0	9.0	-	-	7.5	6.451	Sandy Clay / Clay
MW02	19/08/2020	638.200	9.0	5.0	9.0	-	-	5.5	7.952	Sandy Clay / Clay
MW03	19/08/2020	638.600	9.0	5.0	9.0	-	-	7.7	8.284	Clay / Sandy Clay
MW04	19/08/2020	638.090	9.0	5.0	9.0	-	-	7.0	7.877	Sandy Clay
MW05	19/08/2020	638.110	10.0	5.0	10.0	-	-	5.8	7.692	Sandy Clay / Gravelly Clay
MW06	19/08/2020	638.010	9.0	5.0	9.0	-	-	6.4	7.238	Clay / Gravelly Clay
MW07	19/08/2020	638.050	9.0	5.0	9.0	-	-	7.0	6.755	Clay / Gravelly Clay
MW08*	19/08/2020	637.920	6.0	5.0	6.0	-	-	6.3	4.238	Sandy Clay / Gravelly Clay
MW09	9/06/2021	637.767	9.0	4.5	9.0	-	-	7.9	6.452	Clay / Gravelly Clay
MW10	9/06/2021	634.887	8.0	3.5	8.0	-	-	7.5	4.022	Sandy Clay / Gravelly Clay
MW11	9/06/2021	636.035	9.0	4.5	9.0	-	-	9.5	5.102	Clay / Gravelly Clay
MW12	8/06/2021	636.155	9.0	4.5	9.0	-	-	7.8	5.242	Clay / Gravelly Clay
MW13	8/06/2021	635.497	9.0	4.5	9.0	-	-	4.8	4.338	Clay / Gravelly Clay

m AHD: metres Australian Height Datum

MGA: Map Grid of Australia

*: Installed to 8.0 m, however borehole collapse

Table 9: Groundwater Gauging Data

Well ID	Gauging Date	TOC Elevation (mAHD)	Ground Surface Elevation (mAHD)	Depth of Well (mbTOC)	Depth to NAPL (mbTOC)	Depth to Water (mbTOC)	NAPL Thickness (m)	Corrected Depth to Water (m)	Water Elevation (mAHD)
W1	7/07/2021	637.330	638.900	12.060	-	6.337	-	7.907	630.993
W2	5/07/2021	636.230	635.310	11.513	-	5.362	-	4.442	630.868
W3	7/07/2021	635.810	635.070	9.540	-	5.053	-	4.313	630.757
MW01	7/07/2021	637.670	637.700	8.567	-	6.451	-	6.481	631.219
MW02	5/07/2021	638.200	638.195	8.700	-	6.502	-	6.497	631.698
MW03	8/07/2021	638.600	638.660	8.983	-	7.230	-	7.290	631.370
MW04	8/07/2021	638.090	638.200	9.078	-	6.968	-	7.078	631.122
MW05	8/07/2021	638.110	638.180	9.973	-	6.448	-	6.518	631.662
MW06	7/07/2021	638.010	638.110	8.972	-	6.177	-	6.277	631.833
MW07	7/07/2021	638.050	638.150	9.187	-	5.913	-	6.013	632.137
MW08	7/07/2021	637.920	637.830	6.132	-	5.550	-	5.460	632.370
MW09	5/07/2021	637.767	637.849	9.075	-	6.452	-	6.534	631.315
MW10	5/07/2021	634.887	634.986	8.014	-	4.022	-	4.121	630.865
MW11	7/07/2021	636.035	636.133	9.001	-	5.102	-	5.200	630.933
MW12	7/07/2021	636.155	636.282	8.465	-	5.242	-	5.369	630.913
MW13	5/07/2021	635.497	635.575	9.024	-	4.338	-	4.416	631.159

m AHD: metres Australian Height Datum

mbTOC: metres below top of casing

NAPL: non-aqueous phase liquid

Table 10: Groundwater Quality Parameters

Location ID	Date Sampled	DO (mg/L)	EC (μScm^{-1})	TDS (mg/L)	pH	Eh (mV)	TEMP ($^{\circ}\text{C}$)	Purge Volume (L)	Comments
W1	7/07/2021	6.22	2,344	1,570	7.22	20	13.57	2.5	Clear, no odour or sheen, well in good condition
W2	5/07/2021	4.42	1,276	855	7.17	-6.2	14.81	3.0	Slightly cloudy, brown tinge, no odour or sheen, well in good condition
W3	7/07/2021	5.43	504	338	7.23	26.2	13.92	2.5	Slightly cloudy becoming clear, no odour or sheen, well in good condition
MW01	7/07/2021	1.87	967	967	7.01	15.2	14.94	2.5	Clear, no odour or sheen, well in good condition
MW02	5/07/2021	1.62	693	464	7.11	-43.6	13.83	2.5	Slightly cloudy becoming clear, slight hydrocarbon odour, no sheen, well in good condition
MW03	8/07/2021	4.00	1,828	1,225	7.78	33.7	13.08	2.5	Clear, no odour or sheen, well in good condition
MW04	8/07/2021	5.13	1,282	859	7.58	56.6	12.90	2.5	Clear, no odour or sheen, well in good condition
MW05	8/07/2021	4.14	1,077	722	7.48	30.1	13.33	2.5	Clear, no odour or sheen, well in good condition
MW06	7/07/2021	3.56	389	261	6.80	-100.7	13.47	2.5	Clear, strong hydrocarbon odour, slight sheen, well in good condition
MW07	7/07/2021	6.64	740	496	7.11	0.8	14.03	2.5	Clear, no odour or sheen, well in good condition
MW08	7/07/2021	4.9	425	285	7.41	-47.1	12.84	2.5	Clear, no odour or sheen, well in good condition
MW09	5/07/2021	3.52	869	582	7.47	67.4	14.12	2.5	Slightly cloudy, brown, no odour or sheen, well in good condition
MW10	5/07/2021	4.25	721	483	7.29	-42.3	16.32	2.5	Slightly cloudy becoming clear, slight hydrocarbon odour, no sheen, well in good condition
MW11	7/07/2021	3.89	1,171	785	7.60	2.9	14.15	2.5	Slightly cloudy, brown tinge, no odour or sheen, well in good condition
MW12	7/07/2021	6.22	944	632	7.41	20.1	13.43	2.5	Slightly cloudy, brown tinge, no odour or sheen, well in good condition
MW13	5/07/2021	5.12	649	435	7.66	-10.6	14.73	2.5	Slightly cloudy, brown tinge, no odour or sheen, well in good condition

Table 11: Groundwater Analytical Summary - TRH & BTEXN ($\mu\text{g/L}$)

Sample Identification	Date Sampled	BTEXN					TRH					
		Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	C ₆ - C ₉ TRH	F1 > C ₆ - C ₁₀ TRH	F2 > C ₁₀ - C ₁₆ TRH	F3 > C ₁₆ - C ₃₄ TRH	F4 > C ₃₄ - C ₄₀ TRH	> C ₁₀ - C ₄₀ TRH
LOR		1	2	2	2	2	20	20	100	100	100	100
<i>Analytical - Groundwater</i>												
W1	7/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
W2	5/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
W3	7/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW01	7/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	470	nd	470
MW02	5/07/2021	nd	nd	nd	nd	nd	30	30	270	660	nd	930
MW03	8/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW04	8/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW05	8/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW06	7/07/2021	nd	nd	2	nd	15	nd	nd	1,160	1,740	nd	2,920
MW07	7/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW08	7/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW09	5/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW10	5/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW11	7/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW12	7/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW13	5/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
<i>Statistics</i>												
Samples analysed		16	16	16	16	16	16	16	16	16	16	16
Detects		0	0	1	0	1	1	1	2	3	0	3
% detect		0%	0%	6%	0%	6%	6%	6%	13%	19%	0%	19%
Maximum		<1	<2	2	<2	15	30	30	1,160	1,740	<100	2,920
Mean		<1	<2	0.1	<2	0.9	1.9	1.9	89.4	179.4	<100	270
Median		<1	<2	2	<2	15	30	30	715	660	<100	930
Minimum		<1	<2	<2	<2	<2	<20	<20	<100	<100	<100	<100
<i>Criteria - Commercial / Industrial</i>												
ANZG (2018) 95% Level of Species Protection		950	180	80	75	16	-	-	-	-	-	-
GILs Drinking Water		1	800	300	600	-	-	-	-	-	-	-
HSL D 4 m to < 8 m (Clay)		30,000	NL	NL	NL	NL	NL	NL	NL	-	-	-
HSL D > 8 m (Clay)		35,000	NL	NL	NL	NL	NL	NL	NL	-	-	-
HSL D Intrusive Maintenance Worker 2 m to < 4m (Clay)		NL	NL	NL	NL	NL	NL	NL	NL			
HSL D Intrusive Maintenance Worker 4 m to < 8 m (Clay)		NL	NL	NL	NL	NL	NL	NL	NL	-	-	-
HSL D Intrusive Maintenance Worker > 8 m (Clay)		NL	NL	NL	NL	NL	NL	NL	NL	-	-	-

Table 12: Groundwater Analytical Summary - Metals (µg/L)

Sample Identification	Date Sampled	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Mercury
<i>LOR</i>		<i>1</i>	<i>0.1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>5</i>	<i>0.1</i>
<i>Analytical - Groundwater</i>									
W1	7/07/2021	nd	nd	1	nd	nd	nd	22	nd
W2	5/07/2021	nd	nd	40	nd	nd	nd	nd	nd
W3	7/07/2021	nd	nd	4	nd	nd	nd	nd	nd
MW01	7/07/2021	nd	nd	nd	nd	nd	1	7	nd
MW02	5/07/2021	1	nd	nd	nd	nd	2	8	nd
MW03	8/07/2021	nd	nd	2	nd	nd	nd	6	nd
MW04	8/07/2021	nd	nd	3	nd	nd	nd	nd	nd
MW05	8/07/2021	nd	nd	1	2	nd	nd	nd	nd
MW06	7/07/2021	1	nd	nd	nd	nd	4	nd	nd
MW07	7/07/2021	nd	nd	nd	nd	nd	nd	nd	nd
MW08	7/07/2021	nd	nd	3	nd	nd	nd	9	nd
MW09	5/07/2021	nd	nd	14	nd	nd	nd	6	nd
MW10	5/07/2021	nd	nd	nd	nd	nd	nd	nd	nd
MW11	7/07/2021	nd	nd	32	nd	nd	nd	nd	nd
MW12	7/07/2021	nd	nd	11	nd	nd	nd	nd	nd
MW13	5/07/2021	nd	nd	4	nd	nd	nd	nd	nd
<i>Statistics</i>									
Samples analysed		16	16	16	16	16	16	16	16
Detects		2	0	11	1	0	3	6	0
% detect		13%	0%	69%	6%	0%	19%	38%	0%
Maximum		1.0	<0.1	40	2.0	<1	4.0	22.0	<0.1
Mean		0.1	<0.1	7.2	0.1	<1	0.4	3.6	<0.1
Median		1.0	<0.1	4.0	2.0	<1	2.0	7.5	<0.1
Minimum		<1	<0.1	<1	<1	<1	<1	<5	<0.1
<i>Criteria - Commercial / Industrial</i>									
ANZG (2018) 95% Level of Species Protection		13**	0.2	1*	1.4	3.4	11	8	0.06***
GILs Drinking Water		10	2	50	2,000	10	20	-	1

Table 13: Groundwater Analytical Summary - PAHs (µg/L)

Sample Identification	Date Sampled	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1.2.3-cd)pyrene	Dibenz(a,h)anthracene	Benzo(g,h,i)perylene	Total PAHs	B(a)P TEQ
LOR		1	1	1	1	1	1	1	1	1	1	1	1	0.5	1	1	1	0.5	0.5
<i>Analytical - Groundwater</i>																			
W1	7/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
W2	5/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
W3	7/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW01	7/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW02	5/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW03	8/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW04	8/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW05	8/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW06	7/07/2021	8.8	nd	1	2.3	<u>1.6</u>	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	13.7	nd
MW07	7/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW08	7/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW09	5/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW10	5/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW11	7/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW12	7/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW13	5/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
<i>Statistics</i>																			
Samples analysed		16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
Detects		1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0
% detect		6%	0%	6%	6%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%
Maximum		8.8	<1	1.0	2.3	<u>1.6</u>	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	<1	13.7	<0.5
Mean		0.6	<1	0.1	0.1	0.1	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	<1	0.9	<0.5
Median		8.8	<1	1.0	2.3	1.6	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	<1	13.7	<0.5
Minimum		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	<1	<0.5	<0.5
<i>Criteria - Commercial / Industrial</i>																			
ANZG (2018) 95% Level of Species Protection		16	-	-	-	<u>0.6***</u>	0.01***	-	-	-	-	-	-	0.1***	-	-	-	-	-
GILs Drinking Water		-	-	-	-	-	-	-	-	-	-	-	-	0.01	-	-	-	-	-

Table 14: Groundwater Analytical Summary - VOCs / SVOCs (µg/L)

Sample Identification	Date Sampled	1,2-dichloroethane	cis-1.2-Dichloroethene	Chloroethane	Chloroform	Bromodichloromethane	Chloromethane	Trichloroethene	Tetrachloroethene	Vinyl chloride	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	1.2.4-Trimethylbenzene	Bromobenzene	Chlorobenzene	Methyl Ethyl Ketone	2-hexanone (MBK)	p-Isopropyltoluene
LOR		5	5	50	5	5	50	5	5	50	5	5	5	5	5	5	50	50	5
<i>Analytical - Groundwater</i>																			
W1	7/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
W2	5/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
W3	7/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW01	7/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW02	5/07/2021	nd	nd	nd	27	11	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW03	8/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW04	8/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW05	8/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW06	7/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	14	nd	nd	nd	nd	nd
MW07	7/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW08	7/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW09	5/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW10	5/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW11	7/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW12	7/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW13	5/07/2021	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
<i>Statistics</i>																			
Samples analysed		16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
Detects		0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0
% detect		0%	0%	0%	6%	6%	0%	0%	0%	0%	0%	0%	0%	6%	0%	0%	0%	0%	0%
Maximum		<5	<5	<50	27.0	11.0	<50	<5	<5	<50	<5	<5	<5	14.0	<5	<5	<50	<50	<5
Mean		<5	<5	<50	1.7	0.7	<50	<5	<5	<50	<5	<5	<5	0.9	<5	<5	<50	<50	<5
Median		<5	<5	<50	27.0	11.0	<50	<5	<5	<50	<5	<5	<5	14.0	<5	<5	<50	<50	<5
Minimum		<5	<5	<50	<5	<5	<50	<5	<5	<50	<5	<5	<5	<5	<5	<5	<50	<50	<5
<i>Criteria - Commercial / Industrial</i>																			
ANZG (2018) 95% Level of Species Protection		1,900	-	-	370	-	-	-	-	-	160	260	60	85	-	55	-	-	-
GILs Drinking Water		-	60	-	250	250	4	-	-	0.3	1,500	-	40	-	-	300	-	-	-

Table 15: Groundwater Analytical Summary - Quality Control (µg/L)

Analyte	LOR ug/L	MW10	QW01	RPD	MW10	QW02	RPD	Trip Blank	Trip Spike	Trip Spike Control	Trip Spike
Type	-	Primary	Intra- Laboratory Duplicate	%	Primary	Inter- Laboratory Duplicate	%	Lab prep	Lab prep	Lab	Recovery
Date	-	05/07/21	05/07/21		05/07/21	05/07/21		05/07/21	05/07/21	05/07/21	-
Metals											
Arsenic	1	nd	nd	-	nd	nd	-	-	-	-	-
Cadmium	0.1	nd	nd	-	nd	nd	-	-	-	-	-
Chromium	1	nd	nd	-	nd	nd	-	-	-	-	-
Copper	1	nd	nd	-	nd	nd	-	-	-	-	-
Lead	1	nd	nd	-	nd	nd	-	-	-	-	-
Nickel	1	nd	nd	-	nd	nd	-	-	-	-	-
Zinc	5	nd	nd	-	nd	nd	-	-	-	-	-
Mercury	0.1	nd	nd	-	nd	nd	-	-	-	-	-
BTEXN											
Benzene	1	nd	nd	-	nd	nd	-	nd	15	20	75
Toluene	2	nd	nd	-	nd	nd	-	nd	15	20	75
Ethylbenzene	2	nd	nd	-	nd	nd	-	nd	14	20	70
meta- & para-Xylene	2	nd	nd	-	nd	nd	-	nd	14	20	70
ortho-xylene	2	nd	nd	-	nd	nd	-	nd	15	20	75
Naphthalene	5	nd	nd	-	nd	nd	-	nd	17	20	85
TPHs C6 - C9	10	nd	nd	-	nd	nd	-	nd	-	-	-
TPHs C10 - C14	10	nd	nd	-	nd	nd	-	-	-	-	-
TPHs >C15 - C28	50	nd	nd	-	nd	nd	-	-	-	-	-
TPHs >C29 - C36	100	nd	nd	-	nd	nd	-	-	-	-	-
Sum of PAHs	2	nd	nd	-	nd	nd	-	-	-	-	-
Data Quality Indicator	-	-	-	<50%		-	<50%	-	-	-	70-130%

Groundwater Analytical Summary Table Notes

LOR - limit of reporting (standard LOR unless otherwise shown)

nd - not detected above the LOR

Bold - Exceeds criteria

^ - LOR raised

- denotes not analysed/not available

NL - Not limiting

*- Chromium criteria as Cr(VI)

** - Low reliability trigger value, used as interim working level only.

*** - Bioaccumulative, therefore a higher protection level has been adopted. For example, a PC95 will be increased to PC99, a PC80 will be increased to PC90.

Health Screening Levels (HSLs) for vapour intrusion in a clay geology has been derived based on field observations.

HSL D - Commercial/industrial

GILs Drinking Water - National Health and Medical Research Council (NHMRC) (2011) Australian Drinking Water Guidelines (Updated August 2018) (NHMRC (2011) ADWG)

ANZG (2018) - Australian and New Zealand Guidelines for Fresh and Marine Water Quality (<http://www.waterquality.gov.au/anz-guidelines> as accessed 22 June 2020) (ANZG 2018)

Appendix A

Field Data and Calibration Records



Ground Water Sampling Sheet

Job Name: ARTC Goulburn Roundhouse	Well No: MW 01
Job Number: 20025.76	Well Type: <input checked="" type="checkbox"/> Monitor <input type="checkbox"/> Extractor <input type="checkbox"/> Other
Recorded By: M.Wright	Well Material: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Other
Date: 7/07/2021	Sample by: M.Wright

PURGING

PURGE VOLUME Well Diameter (D in mm): <input checked="" type="checkbox"/> 50 <input type="checkbox"/> 100 <input type="checkbox"/> Other Total Depth of Well (TD in m BTOC): 12.060 Water Level Depth WL in m BTOC): 6.337 Number of well volumes to be purged (# VOLS) <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 10 <input type="checkbox"/> Other	PURGE METHOD <input type="checkbox"/> Bailer - Type: <input type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Teflon <input type="checkbox"/> Other <input checked="" type="checkbox"/> Pump - Type: <input type="checkbox"/> Submersible <input checked="" type="checkbox"/> Peristaltic <input type="checkbox"/> Other PUMP INTAKE SETTING Depth (m BTOC) Screen Interval (m BTOC) - Top : Bottom:
PURGE TIME PURGE TIME 25 mins PURGE RATE 4.0 L ACTUAL PURGE VOLUME 2.5 L Start: Stop: Elapsed: Initial: Final:	

FIELD PARAMETER MEASUREMENTS								
Min since purge began	Volume Purged (L)	pH	Cond. (mS/cm)	Temp (°C)	DO (mg/L)	Redox (mV)	SWL (mBTOC)	Other (e.g. observations)
5	0.5	7.11	2334	13.89	6.67	22.6	6.339	
10	1.0	7.10	2337	13.88	6.13	22.2	6.340	
15	1.5	7.28	2302	13.26	6.51	20.4	6.342	
20	2.0	7.24	2323	13.56	6.37	20.2	6.344	
25	2.5	7.22	2344	13.57	6.22	20.0	6.346	

Observations during purging (well condition, turbidity, colour, odour, sheen):
clear, no odour, no sheen, well in good condition

Discharge water disposal: Drums Sanitary sewer Storm sewer Surface Other

SAMPLING

SAMPLING METHOD Same as purge method

Bailer - Type: PVC SS Teflon Other Pump - Type: PVC SS Teflon Other

SAMPLE DISTRIBUTION Sample Name:

Bottles:	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1	100 ml Amber	PAHs/TRH	unpreserved	ALS	
1	60 ml plastic	Metals	HNO ₃	ALS	field filtered? (Y) / N
2	40 ml VOA vials	BTEXN/VOCs/TRH	HCl	ALS	

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No
 	 	 	 	 	



Ground Water Sampling Sheet

Job Name: ARTC Goulburn Roundhouse	Well No: MW 2
Job Number: 20025.76	Well Type: <input checked="" type="checkbox"/> Monitor <input type="checkbox"/> Extractor <input type="checkbox"/> Other
Recorded By: M.Wright	Well Material: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Other
Date: 8/07/2021	Sample by: M.Wright

PURGING

PURGE VOLUME	PURGE METHOD
Well Diameter (D in mm): <input checked="" type="checkbox"/> 50 <input type="checkbox"/> 100 <input type="checkbox"/> Other	<input type="checkbox"/> Bailer - Type: <input type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Teflon <input type="checkbox"/> Other
Total Depth of Well (TD in m BTOC): 11.513	<input checked="" type="checkbox"/> Pump - Type: <input type="checkbox"/> Submersible <input checked="" type="checkbox"/> Peristaltic <input type="checkbox"/> Other
Water Level Depth WL in m BTOC): 5.362	PUMP INTAKE SETTING
Number of well volumes to be purged (# VOLS) <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 10 <input type="checkbox"/> Other	Depth (m BTOC) Screen Interval (m BTOC) - Top : Bottom:
PURGE TIME PURGE TIME 25 mins PURGE RATE 2.0L ACTUAL PURGE VOLUME 2.5L	
Start: Stop: Elapsed: Initial: Final:	

FIELD PARAMETER MEASUREMENTS

Min since purge began	Volume Purged (L)	pH	Cond. (mS/cm)	Temp (°C)	DO (mg/L)	Redox (mV)	SWL (mBTOC)	Other (e.g. observations)
5	0.5	7.13	1160	14.87	4.83	-1.8	5.401	
10	1.0	7.12	1253	14.88	4.61	-2.3	5.405	
15	1.5	7.17	1171	14.82	4.74	-5.9	5.407	
20	2.0	7.17	1259	14.82	4.64	-5.9	5.408	
25	2.5	7.17	1255	14.82	4.52	-6.0	5.408	
30	3.0	7.17	1279	14.81	4.42	-6.2	5.407	

Observations during purging (well condition, turbidity, colour, odour, sheen):

Slightly cloudy, brown tinge, no odour or sheen

Discharge water disposal: Drums Sanitary sewer Storm sewer Surface Other

SAMPLING

SAMPLING METHOD Same as purge method

Bailer - Type: PVC SS Teflon Other Pump - Type: PVC SS Teflon Other

SAMPLE DISTRIBUTION Sample Name:

Bottles:	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1	100 ml Amber	PAHs/TRH	unpreserved	ALS	
1	60 ml plastic	Metals	HNO ₃	ALS	field filtered? (Y) / N
2	40 ml VOA vials	BTEXN/VOCs/TRH	HCl	ALS	

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No
	/		/		/



Ground Water Sampling Sheet

Job Name: ARTC Goulburn Roundhouse	Well No: 140 <u>W3</u>
Job Number: 20025.76	Well Type: <input checked="" type="checkbox"/> Monitor <input type="checkbox"/> Extractor <input type="checkbox"/> Other
Recorded By: M.Wright	Well Material: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Other
Date: <u>7/07/2021</u>	Sample by: M.Wright

PURGING

PURGE VOLUME	PURGE METHOD
Well Diameter (D in mm): <input checked="" type="checkbox"/> 50 <input type="checkbox"/> 100 <input type="checkbox"/> Other	<input type="checkbox"/> Bailer - Type: <input type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Teflon <input type="checkbox"/> Other
Total Depth of Well (TD in m BTOC): <u>9.540</u>	<input checked="" type="checkbox"/> Pump - Type: <input type="checkbox"/> Submersible <input checked="" type="checkbox"/> Peristaltic <input type="checkbox"/> Other
Water Level Depth WL in m BTOC): <u>5.053</u>	PUMP INTAKE SETTING
Number of well volumes to be purged (# VOLS) <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 10 <input type="checkbox"/> Other	Depth (m BTOC)
	Screen Interval (m BTOC) - Top : Bottom:

PURGE TIME
 PURGE TIME 25 mins PURGE RATE 4.06 ACTUAL PURGE VOLUME 25L
 Start: Stop: Elapsed: Initial: Final:

FIELD PARAMETER MEASUREMENTS

Min since purge began	Volume Purged (L)	pH	Cond. (µS/cm)	Temp (°C)	DO (mg/L)	Redox (mV)	SWL (mBTOC)	Other (e.g. observations)
5	0.5	7.57	524	14.00	6.18	32.4	5.054	
10	1.0	7.47	532	14.02	5.40	32.0	5.055	
15	1.5	7.28	504	13.89	5.80	26.2	5.057	
20	2.0	7.25	504	13.92	5.61	26.2	5.060	
25	2.5	7.23	504	13.92	5.43	26.2	5.060	

Observations during purging (well condition, turbidity, colour, odour, sheen):
Slightly cloudy becoming clear, No odour or sheen, well in good condition

Discharge water disposal: Drums Sanitary sewer Storm sewer Surface Other

SAMPLING

SAMPLING METHOD Same as purge method
 Bailer - Type: PVC SS Teflon Other Pump - Type: PVC SS Teflon Other

SAMPLE DISTRIBUTION Sample Name:

Bottles:	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1	100 ml Amber	PAHs/TRH	unpreserved	ALS	
1	60 ml plastic	Metals	HNO ₃	ALS	field filtered? (Y) / N
2	40 ml VOA vials	BTEXN/VOCs/TRH	HCl	ALS	

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No
-	-	-	-	-	-



Ground Water Sampling Sheet

Job Name: ARTC Goulburn Roundhouse	Well No: MW01
Job Number: 20025.76	Well Type: <input checked="" type="checkbox"/> Monitor <input type="checkbox"/> Extractor <input type="checkbox"/> Other
Recorded By: M.Wright	Well Material: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Other
Date: 7/07/2021	Sample by: M.Wright

PURGING	
PURGE VOLUME Well Diameter (D in mm): <input checked="" type="checkbox"/> 50 <input type="checkbox"/> 100 <input type="checkbox"/> Other	PURGE METHOD <input type="checkbox"/> Bailer - Type: <input type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Teflon <input type="checkbox"/> Other <input checked="" type="checkbox"/> Pump - Type: <input type="checkbox"/> Submersible <input checked="" type="checkbox"/> Peristaltic <input type="checkbox"/> Other
Total Depth of Well (TD in m BTOC): 8.700	PUMP INTAKE SETTING
Water Level Depth WL in m BTOC): 6.502	
Number of well volumes to be purged (# VOLS) <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 10 <input type="checkbox"/> Other	Depth (m BTOC) Screen Interval (m BTOC) - Top : Bottom:

PURGE TIME	
PURGE TIME 25 mins	PURGE RATE 4.0L ACTUAL PURGE VOLUME 2.5L
Start:	Stop: Elapsed: Initial: Final:

FIELD PARAMETER MEASUREMENTS								
Min since purge began	Volume Purged (L)	pH	Cond. (mS/cm)	Temp (°C)	DO (mg/L)	Redox (mV)	SWL (mBTOC)	Other (e.g. observations)
5	0.5	7.58	1024	13.52	4.69	0.1	6.617	
10	1.0	7.49	1023	13.52	4.40	2.3	6.605	
15	1.5	7.04	924	14.97	1.92	13.4	6.600	
20	2.0	7.02	952	14.98	1.91	14.4	6.587	
25	2.5	7.01	967	14.94	1.87	15.2	6.585	

Observations during purging (well condition, turbidity, colour, odour, sheen):
Clear, No odour or sheen, well in good condition

Discharge water disposal: Drums Sanitary sewer Storm sewer Surface Other

SAMPLING	
SAMPLING METHOD	
<input checked="" type="checkbox"/> Same as purge method	
<input type="checkbox"/> Bailer - Type: <input type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Teflon <input type="checkbox"/> Other	<input type="checkbox"/> Pump - Type: <input type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Teflon <input type="checkbox"/> Other

SAMPLE DISTRIBUTION					
Bottles:	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1	100 ml Amber	PAHs/TRH	unpreserved	ALS	
1	60 ml plastic	Metals	HNO ₃	ALS	field filtered? (Y) / N
2	40 ml VOA vials	BTEXN/VOCs/TRH	HCl	ALS	

QUALITY CONTROL SAMPLES					
Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No
/			/		/



Ground Water Sampling Sheet

Job Name: ARTC Goulburn Roundhouse	Well No: MW 02
Job Number: 20025.76	Well Type: <input checked="" type="checkbox"/> Monitor <input type="checkbox"/> Extractor <input type="checkbox"/> Other
Recorded By: M.Wright	Well Material: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Other
Date: 8/07/2021	Sample by: M.Wright

PURGING	
PURGE VOLUME Well Diameter (D in mm): <input checked="" type="checkbox"/> 50 <input type="checkbox"/> 100 <input type="checkbox"/> Other	PURGE METHOD <input type="checkbox"/> Bailer - Type: <input type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Teflon <input type="checkbox"/> Other <input checked="" type="checkbox"/> Pump - Type: <input type="checkbox"/> Submersible <input checked="" type="checkbox"/> Peristaltic <input type="checkbox"/> Other
Total Depth of Well (TD in m BTOC): 8.920	PUMP INTAKE SETTING
Water Level Depth WL in m BTOC): 7.180	
Number of well volumes to be purged (# VOLS) <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 10 <input type="checkbox"/> Other	Depth (m BTOC) Screen Interval (m BTOC) - Top : Bottom:

PURGE TIME	
PURGE TIME: 25 mins	PURGE RATE: 4.0L ACTUAL PURGE VOLUME: 2.5L
Start:	Stop: Elapsed: Initial: Final:

FIELD PARAMETER MEASUREMENTS								
Min since purge began	Volume Purged (L)	pH	Cond. (mS/cm)	Temp (°C)	DO (mg/L)	Redox (mV)	SWL (mBTOC)	Other (e.g. observations)
5	0.5	7.45	698	13.41	1.95	-40.5	7.199	
10	1.0	7.32	704	13.38	1.73	-44.6	7.201	
15	1.5	7.12	694	13.82	1.83	-42.5	7.284	
20	2.0	7.11	693	13.83	1.41	-43.1	7.205	
25	2.5	7.11	693	13.83	1.62	-43.6	7.206	

Observations during purging (well condition, turbidity, colour, odour, sheen):
slightly cloudy becoming clear, slight H odour, no sheen, well in good condition

Discharge water disposal: Drums Sanitary sewer Storm sewer Surface Other

SAMPLING	
SAMPLING METHOD	
<input checked="" type="checkbox"/> Same as purge method	
<input type="checkbox"/> Bailer - Type: <input type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Teflon <input type="checkbox"/> Other <input type="checkbox"/> Pump - Type: <input type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Teflon <input type="checkbox"/> Other	

SAMPLE DISTRIBUTION Sample Name:					
Bottles:	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1	100 ml Amber	PAHs/TRH	unpreserved	ALS	
1	60 ml plastic	Metals	HNO ₃	ALS	field filtered? (Y) / N
2	40 ml VOA vials	BTEXN/VOCs/TRH	HCl	ALS	

QUALITY CONTROL SAMPLES					
Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No



Ground Water Sampling Sheet

Job Name: ARTC Goulburn Roundhouse	Well No: MW03
Job Number: 20025.76	Well Type: <input checked="" type="checkbox"/> Monitor <input type="checkbox"/> Extractor <input type="checkbox"/> Other
Recorded By: M.Wright	Well Material: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Other
Date: 8/07/2021	Sample by: M.Wright

PURGING

PURGE VOLUME	PURGE METHOD
Well Diameter (D in mm): <input checked="" type="checkbox"/> 50 <input type="checkbox"/> 100 <input type="checkbox"/> Other	<input type="checkbox"/> Bailer - Type: <input type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Teflon <input type="checkbox"/> Other
Total Depth of Well (TD in m BTOC): 8.983	<input checked="" type="checkbox"/> Pump - Type: <input type="checkbox"/> Submersible <input checked="" type="checkbox"/> Peristaltic <input type="checkbox"/> Other
Water Level Depth WL in m BTOC: 7.230	PUMP INTAKE SETTING
Number of well volumes to be purged (# VOLS) <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 10 <input type="checkbox"/> Other	Depth (m BTOC)
	Screen Interval (m BTOC) - Top : Bottom:

PURGE TIME
 PURGE TIME 25 mins PURGE RATE 3.0L ACTUAL PURGE VOLUME 2.5L
 Start: Stop: Elapsed: Initial: Final:

FIELD PARAMETER MEASUREMENTS

Min since purge began	Volume Purged (L)	pH	Cond. (mS/cm)	Temp (°C)	DO (mg/L)	Redox (mV)	SWL (mBTOC)	Other (e.g. observations)
5	0.5	7.80	1957	11.99	5.99	50.8	7.333	
10	1.0	7.77	1963	12.00	5.11	49.8	7.334	
15	1.5	7.79	1844	13.08	4.18	54.9	7.333	
20	2.0	7.79	1838	13.10	4.01	53.8	7.330	
25	2.5	7.78	1828	13.09	4.00	53.7	7.328	

Observations during purging (well condition, turbidity, colour, odour, sheen):
clear, no odour, no sheen, well in good condition

Discharge water disposal: Drums Sanitary sewer Storm sewer Surface Other

SAMPLING

SAMPLING METHOD Same as purge method
 Bailer - Type: PVC SS Teflon Other Pump - Type: PVC SS Teflon Other

SAMPLE DISTRIBUTION Sample Name:

Bottles:	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1	100 ml Amber	PAHs/TRH	unpreserved	ALS	
1	60 ml plastic	Metals	HNO ₃	ALS	field filtered? (Y) / N
2	40 ml VOA vials	BTEXN/VOCs/TRH	HCl	ALS	

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No
 	 	 	 	 	



Ground Water Sampling Sheet

Job Name: ARTC Goulburn Roundhouse	Well No: MW04
Job Number: 20025.76	Well Type: <input checked="" type="checkbox"/> Monitor <input type="checkbox"/> Extractor <input type="checkbox"/> Other
Recorded By: M.Wright	Well Material: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Other
Date: 8/07/2021	Sample by: M.Wright

PURGING	
PURGE VOLUME Well Diameter (D in mm): <input checked="" type="checkbox"/> 50 <input type="checkbox"/> 100 <input type="checkbox"/> Other	PURGE METHOD <input type="checkbox"/> Bailer - Type: <input type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Teflon <input type="checkbox"/> Other <input checked="" type="checkbox"/> Pump - Type: <input type="checkbox"/> Submersible <input checked="" type="checkbox"/> Peristaltic <input type="checkbox"/> Other
Total Depth of Well (TD in m BTOC): 9.78	PUMP INTAKE SETTING
Water Level Depth WL in m BTOC): 6.968	
Number of well volumes to be purged (# VOLS) <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 10 <input type="checkbox"/> Other	Depth (m BTOC)
	Screen Interval (m BTOC) - Top : Bottom:

PURGE TIME
 PURGE TIME 25 mins PURGE RATE 4.0L ACTUAL PURGE VOLUME 2.5L
 Start: Stop: Elapsed: Initial: Final:

FIELD PARAMETER MEASUREMENTS								
Min since purge began	Volume Purged (L)	pH	Cond. (mS/cm)	Temp (°C)	DO (mg/L)	Redox (mV)	SWL (mBTOC)	Other (e.g. observations)
5	0.5	7.62	1167	11.70	7.13	62.3	7.015	
10	1.0	7.61	1176	11.22	6.56	62.0	7.017	
15	1.5	7.66	1264	12.94	5.36	57.8	7.030	
20	2.0	7.54	1267	12.92	5.17	56.8	7.029	
25	2.5	7.54	1282	12.90	5.13	56.6	7.027	

Observations during purging (well condition, turbidity, colour, odour, sheen):
Clear, no odour or sheen, well in good condition.

Discharge water disposal: Drums Sanitary sewer Storm sewer Surface Other

SAMPLING	
SAMPLING METHOD	
<input checked="" type="checkbox"/> Same as purge method	
<input type="checkbox"/> Bailer - Type: <input type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Teflon <input type="checkbox"/> Other <input type="checkbox"/> Pump - Type: <input type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Teflon <input type="checkbox"/> Other	

SAMPLE DISTRIBUTION					
Bottles:	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1	100 ml Amber	PAHs/TRH	unpreserved	ALS	
1	60 ml plastic	Metals	HNO ₃	ALS	field filtered? (Y) / N
2	40 ml VOA vials	BTEXN/VOCs/TRH	HCl	ALS	

QUALITY CONTROL SAMPLES					
Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No



Ground Water Sampling Sheet

Job Name: ARTC Goulburn Roundhouse	Well No: MW 05
Job Number: 20025.76	Well Type: <input checked="" type="checkbox"/> Monitor <input type="checkbox"/> Extractor <input type="checkbox"/> Other
Recorded By: M.Wright	Well Material: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Other
Date: 3/07/2021	Sample by: M.Wright

PURGING

PURGE VOLUME	PURGE METHOD
Well Diameter (D in mm): <input checked="" type="checkbox"/> 50 <input type="checkbox"/> 100 <input type="checkbox"/> Other	<input type="checkbox"/> Bailer - Type: <input type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Teflon <input type="checkbox"/> Other
Total Depth of Well (TD in m BTOC): 9.973	<input checked="" type="checkbox"/> Pump - Type: <input type="checkbox"/> Submersible <input checked="" type="checkbox"/> Peristaltic <input type="checkbox"/> Other
Water Level Depth WL in m BTOC): 6.448	PUMP INTAKE SETTING
Number of well volumes to be purged (# VOLS) <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 10 <input type="checkbox"/> Other	Depth (m BTOC)
	Screen Interval (m BTOC) - Top : Bottom:

PURGE TIME
 PURGE TIME 2.25 mins PURGE RATE 4.02 ACTUAL PURGE VOLUME _____
 Start: Stop: Elapsed: Initial: Final:

FIELD PARAMETER MEASUREMENTS

Min since purge began	Volume Purged (L)	pH	Cond. (mS/cm)	Temp (°C)	DO (mg/L)	Redox (mV)	SWL (mBTOC)	Other (e.g. observations)
5	0.5	7.61	573	12.15	6.48	27.9	6.478	
10	1.0	7.56	499	12.17	5.46	26.9	6.483	
15	1.5	7.53	1080	13.31	4.25	30.8	6.485	
20	2.0	7.53	1084	13.34	4.21	31.0	6.487	
25	2.5	7.48	1677	13.33	4.14	30.1	6.488	

Observations during purging (well condition, turbidity, colour, odour, sheen):
clear, no odour or sheen, well in good condition

Discharge water disposal: Drums Sanitary sewer Storm sewer Surface Other

SAMPLING

SAMPLING METHOD Same as purge method
 Bailer - Type: PVC SS Teflon Other Pump - Type: PVC SS Teflon Other

SAMPLE DISTRIBUTION Sample Name:

Bottles:	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1	100 ml Amber	PAHs/TRH	unpreserved	ALS	
1	60 ml plastic	Metals	HNO ₃	ALS	field filtered? (Y) / N
2	40 ml VOA vials	BTEXN/VOCs/TRH	HCl	ALS	

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No
 	 	 	 	 	

6.448



Ground Water Sampling Sheet

Job Name: ARTC Goulburn Roundhouse	Well No: MW 06
Job Number: 20025.76	Well Type: <input checked="" type="checkbox"/> Monitor <input type="checkbox"/> Extractor <input type="checkbox"/> Other
Recorded By: M.Wright	Well Material: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Other
Date: 7/07/2021	Sample by: M.Wright

PURGING

PURGE VOLUME	PURGE METHOD
Well Diameter (D in mm): <input checked="" type="checkbox"/> 50 <input type="checkbox"/> 100 <input type="checkbox"/> Other	<input type="checkbox"/> Bailer - Type: <input type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Teflon <input type="checkbox"/> Other
Total Depth of Well (TD in m BTOC): 8.972	<input checked="" type="checkbox"/> Pump - Type: <input type="checkbox"/> Submersible <input checked="" type="checkbox"/> Peristaltic <input type="checkbox"/> Other
Water Level Depth WL in m BTOC): 6.177	PUMP INTAKE SETTING
Number of well volumes to be purged (# VOLS) <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 10 <input type="checkbox"/> Other	Depth (m BTOC) Screen Interval (m BTOC) - Top : Bottom:
PURGE TIME	
PURGE TIME 25 mins PURGE RATE 4.0L ACTUAL PURGE VOLUME 2.5L	
Start: Stop: Elapsed: Initial: Final:	

FIELD PARAMETER MEASUREMENTS

Min since purge began	Volume Purged (L)	pH	Cond. (mS/cm)	Temp (°C)	DO (mg/L)	Redox (mV)	SWL (mBTOC)	Other (e.g. observations)
5	0.5	6.93	454	13.01	2.31	-103.7	6.183	
10	1.0	6.91	440	13.02	2.14	-104.7	6.184	
15	1.5	6.81	382	13.54	3.76	-101.5	6.187	
20	2.0	6.80	384	13.58	3.60	-101.2	6.186	
25	2.5	6.80	389	13.47	3.56	-100.7	6.185	

Observations during purging (well condition, turbidity, colour, odour, sheen):

clear, strong H₂S odour, very slight sheen, well in good condition

Discharge water disposal: Drums Sanitary sewer Storm sewer Surface Other

SAMPLING

SAMPLING METHOD Same as purge method

Bailer - Type: PVC SS Teflon Other Pump - Type: PVC SS Teflon Other

SAMPLE DISTRIBUTION Sample Name:

Bottles:	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1	100 ml Amber	PAHs/TRH	unpreserved	ALS	
1	60 ml plastic	Metals	HNO ₃	ALS	field filtered? (Y) / N
2	40 ml VOA vials	BTEXN/VOCs/TRH	HCl	ALS	

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No



Ground Water Sampling Sheet

Job Name: ARTC Goulburn Roundhouse	Well No: MW 07
Job Number: 20025.76	Well Type: <input checked="" type="checkbox"/> Monitor <input type="checkbox"/> Extractor <input type="checkbox"/> Other
Recorded By: M.Wright	Well Material: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Other
Date: 7/07/2021	Sample by: M.Wright

PURGING	
PURGE VOLUME Well Diameter (D in mm): <input checked="" type="checkbox"/> 50 <input type="checkbox"/> 100 <input type="checkbox"/> Other	PURGE METHOD <input type="checkbox"/> Bailer - Type: <input type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Teflon <input type="checkbox"/> Other <input checked="" type="checkbox"/> Pump - Type: <input type="checkbox"/> Submersible <input checked="" type="checkbox"/> Peristaltic <input type="checkbox"/> Other
Total Depth of Well (TD in m BTOC): 9.187	PUMP INTAKE SETTING
Water Level Depth WL in m BTOC): 5.713	
Number of well volumes to be purged (# VOLS) <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 10 <input type="checkbox"/> Other	Depth (m BTOC) Screen Interval (m BTOC) - Top : Bottom:

PURGE TIME	
PURGE TIME: 25 mins	PURGE RATE: 4.0 L
VOLUME: 25L	ACTUAL PURGE
Start:	Stop: Elapsed: Initial: Final:

FIELD PARAMETER MEASUREMENTS								
Min since purge began	Volume Purged (L)	pH	Cond. (mS/cm)	Temp (°C)	DO (mg/L)	Redox (mV)	SWL (mBTOC)	Other (e.g. observations)
5	0.5	7.32	705	12.86	5.75	-9.2	6.015	
10	1.0	7.31	735	12.85	5.48	-9.3	6.015	
15	1.5	7.13	733	14.00	6.82	-0.1	6.014	
20	2.0	7.12	734	14.03	6.68	0.2	6.015	
25	2.5	7.11	740	14.03	6.64	0.8	6.015	

Observations during purging (well condition, turbidity, colour, odour, sheen):
clear, no odour or sheen, well in good condition.

Discharge water disposal: Drums Sanitary sewer Storm sewer Surface Other

SAMPLING	
SAMPLING METHOD	
<input checked="" type="checkbox"/> Same as purge method	
<input type="checkbox"/> Bailer - Type: <input type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Teflon <input type="checkbox"/> Other <input type="checkbox"/> Pump - Type: <input type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Teflon <input type="checkbox"/> Other	

SAMPLE DISTRIBUTION					
Bottles:	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1	100 ml Amber	PAHs/TRH	unpreserved	ALS	
1	60 ml plastic	Metals	HNO ₃	ALS	field filtered? (Y) / N
2	40 ml VOA vials	BTEXN/VOCs/TRH	HCl	ALS	

QUALITY CONTROL SAMPLES					
Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No



Ground Water Sampling Sheet

Job Name: ARTC Goulburn Roundhouse	Well No: MW08
Job Number: 20025.76	Well Type: <input checked="" type="checkbox"/> Monitor <input type="checkbox"/> Extractor <input type="checkbox"/> Other
Recorded By: M.Wright	Well Material: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Other
Date: 7/07/2021	Sample by: M.Wright

PURGING

PURGE VOLUME	PURGE METHOD
Well Diameter (D in mm): <input checked="" type="checkbox"/> 50 <input type="checkbox"/> 100 <input type="checkbox"/> Other	<input type="checkbox"/> Bailer - Type: <input type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Teflon <input type="checkbox"/> Other
Total Depth of Well (TD in m BTOC): 6.132	<input checked="" type="checkbox"/> Pump - Type: <input type="checkbox"/> Submersible <input checked="" type="checkbox"/> Peristaltic <input type="checkbox"/> Other
Water Level Depth WL in m BTOC): 5.550	PUMP INTAKE SETTING
Number of well volumes to be purged (# VOLS) <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 10 <input type="checkbox"/> Other	Depth (m BTOC)
	Screen Interval (m BTOC) - Top : Bottom:

PURGE TIME
 PURGE TIME 25 mins PURGE RATE 4.0 L ACTUAL PURGE VOLUME 25L
 Start: Stop: Elapsed: Initial: Final:

FIELD PARAMETER MEASUREMENTS

Min since purge began	Volume Purged (L)	pH	Cond. (mS/cm)	Temp (°C)	DO (mg/L)	Redox (mV)	SWL (mBTOC)	Other (e.g. observations)
5	0.5	7.44	271	12.95	7.24	-39.9	5.555	
10	1.0	7.47	418	12.97	6.92	-42.9	5.570	
15	1.5	7.45	423	12.98	5.15	-45.7	5.571	
20	2.0	7.43	423	12.90	4.93	-46.9	5.573	
25	2.5	7.41	425	12.84	4.90	-47.1	5.574	

Observations during purging (well condition, turbidity, colour, odour, sheen):
clear, No odour, No sheen, well in good condition, water present in gate

Discharge water disposal: Drums Sanitary sewer Storm sewer Surface Other

SAMPLING

SAMPLING METHOD Same as purge method
 Bailer - Type: PVC SS Teflon Other Pump - Type: PVC SS Teflon Other

SAMPLE DISTRIBUTION Sample Name:

Bottles:	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1	100 ml Amber	PAHs/TRH	unpreserved	ALS	
1	60 ml plastic	Metals	HNO ₃	ALS	field filtered? (Y) / N
2	40 ml VOA vials	BTEXN/VOCs/TRH	HCl	ALS	

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No
 	 	 	 	 	



Ground Water Sampling Sheet

Job Name: ARTC Goulburn Roundhouse	Well No: MW 09
Job Number: 20025.76	Well Type: <input checked="" type="checkbox"/> Monitor <input type="checkbox"/> Extractor <input type="checkbox"/> Other
Recorded By: M.Wright	Well Material: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Other
Date: 5/07/2021	Sample by: M.Wright

PURGING

PURGE VOLUME Well Diameter (D in mm): <input checked="" type="checkbox"/> 50 <input type="checkbox"/> 100 <input type="checkbox"/> Other Total Depth of Well (TD in m BTOC): 9.075 Water Level Depth WL in m BTOC): 6.452 Number of well volumes to be purged (# VOLS) <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 10 <input type="checkbox"/> Other	PURGE METHOD <input type="checkbox"/> Bailer - Type: <input type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Teflon <input type="checkbox"/> Other <input checked="" type="checkbox"/> Pump - Type: <input type="checkbox"/> Submersible <input checked="" type="checkbox"/> Peristaltic <input type="checkbox"/> Other PUMP INTAKE SETTING Depth (m BTOC) Screen Interval (m BTOC) - Top : Bottom:
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PURGE TIME
 PURGE TIME 25 mins PURGE RATE 4.0 L ACTUAL PURGE VOLUME 2.5 L
 Start: Stop: Elapsed: Initial: Final:

FIELD PARAMETER MEASUREMENTS

Min since purge began	Volume Purged (L)	pH	Cond. (mS/cm)	Temp (°C)	DO (mg/L)	Redox (mV)	SWL (mBTOC)	Other (e.g. observations)
5	0.5	7.47	865	13.23	5.30	62.4	6.473	
10	1.0	7.42	873	13.20	4.65	61.1	6.478	
15	1.5	7.52	856	14.00	3.79	72.7	6.491	
20	2.0	7.49	864	14.08	3.63	69.8	6.490	
25	2.5	7.47	869	14.12	3.52	67.4	6.490	

Observations during purging (well condition, turbidity, colour, odour, sheen):
slightly cloudy, brown, no odour, no sheen, well in good condition

Discharge water disposal: Drums Sanitary sewer Storm sewer Surface Other

SAMPLING

SAMPLING METHOD
 Same as purge method
 Bailer - Type: PVC SS Teflon Other Pump - Type: PVC SS Teflon Other

SAMPLE DISTRIBUTION Sample Name:

Bottles:	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1	100 ml Amber	PAHs/TRH	unpreserved	ALS	
1	60 ml plastic	Metals	HNO ₃	ALS	field filtered? (Y) / N
2	40 ml VOA vials	BTEXN/VOCs/TRH	HCl	ALS	

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No
 	 	 	 	 	



Ground Water Sampling Sheet

Job Name: ARTC Goulburn Roundhouse	Well No: MW 11
Job Number: 20025.76	Well Type: <input checked="" type="checkbox"/> Monitor <input type="checkbox"/> Extractor <input type="checkbox"/> Other
Recorded By: M.Wright	Well Material: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Other
Date: 7/07/2021	Sample by: M.Wright

PURGING

PURGE VOLUME	PURGE METHOD
Well Diameter (D in mm): <input checked="" type="checkbox"/> 50 <input type="checkbox"/> 100 <input type="checkbox"/> Other	<input type="checkbox"/> Bailer - Type: <input type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Teflon <input type="checkbox"/> Other
Total Depth of Well (TD in m BTOC): 9.001	<input checked="" type="checkbox"/> Pump - Type: <input type="checkbox"/> Submersible <input checked="" type="checkbox"/> Peristaltic <input type="checkbox"/> Other
Water Level Depth WL in m BTOC: 5.102	PUMP INTAKE SETTING
Number of well volumes to be purged (# VOLS) <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 10 <input type="checkbox"/> Other	Depth (m BTOC)
	Screen Interval (m BTOC) - Top : Bottom:
PURGE TIME	
PURGE TIME: 25 min	PURGE RATE: 4.0L
VOLUME: 2.5L	ACTUAL PURGE
Start:	Stop: Elapsed: Initial: Final:

FIELD PARAMETER MEASUREMENTS								
Min since purge began	Volume Purged (L)	pH	Cond. (mS/cm)	Temp (°C)	DO (mg/L)	Redox (mV)	SWL (mBTOC)	Other (e.g. observations)
5	0.5	7.60	652	13.57	4.41	4.9	5.195	
10	1.0	7.62	1146	13.57	4.22	4.1	5.182	
15	1.5	7.60	1171	14.23	4.00	3.5	5.180	
20	2.0	7.66	1176	14.17	3.95	3.5	5.179	
25	2.5	7.60	1171	14.15	3.89	2.9	5.178	

Observations during purging (well condition, turbidity, colour, odour, sheen):
Slightly cloudy, brown haze, No odour or sheen, well in good condition

Discharge water disposal: Drums Sanitary sewer Storm sewer Surface Other

SAMPLING

SAMPLING METHOD

Same as purge method

Bailer - Type: PVC SS Teflon Other Pump - Type: PVC SS Teflon Other

SAMPLE DISTRIBUTION Sample Name:

Bottles:	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1	100 ml Amber	PAHs/TRH	unpreserved	ALS	
1	60 ml plastic	Metals	HNO ₃	ALS	field filtered? (Y) / N
2	40 ml VOA vials	BTEXN/VOCs/TRH	HCl	ALS	

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No



Ground Water Sampling Sheet

Job Name: ARTC Goulburn Roundhouse	Well No: MW 12
Job Number: 20025.76	Well Type: <input checked="" type="checkbox"/> Monitor <input type="checkbox"/> Extractor <input type="checkbox"/> Other
Recorded By: M.Wright	Well Material: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Other
Date: 7/07/2021	Sample by: M.Wright

PURGING

PURGE VOLUME	PURGE METHOD
Well Diameter (D in mm): <input checked="" type="checkbox"/> 50 <input type="checkbox"/> 100 <input type="checkbox"/> Other	<input type="checkbox"/> Bailer - Type: <input type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Teflon <input type="checkbox"/> Other
Total Depth of Well (TD in m BTOC): 3.465	<input checked="" type="checkbox"/> Pump - Type: <input type="checkbox"/> Submersible <input checked="" type="checkbox"/> Peristaltic <input type="checkbox"/> Other
Water Level Depth WL in m BTOC): 5.242	PUMP INTAKE SETTING
Number of well volumes to be purged (# VOLS) <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 10 <input type="checkbox"/> Other	Depth (m BTOC)
	Screen Interval (m BTOC) - Top : Bottom:
PURGE TIME	
PURGE TIME 25 mins	PURGE RATE 4.0
VOLUME 2.5L	ACTUAL PURGE
Start:	Stop: Elapsed: Initial: Final:

FIELD PARAMETER MEASUREMENTS

Min since purge began	Volume Purged (L)	pH	Cond. (µS/cm)	Temp (°C)	DO (mg/L)	Redox (mV)	SWL (mBTOC)	Other (e.g. observations)
5	0.5	7.47	914	12.98	6.61	32.4	5.357	
10	1.0	7.46	910	12.99	5.29	29.0	5.372	
15	1.5	7.45	950	13.31	6.57	20.6	5.375	
20	2.0	7.43	949	13.42	6.32	20.4	5.378	
25	2.5	7.41	944	13.43	6.22	20.1	5.380	

Observations during purging (well condition, turbidity, colour, odour, sheen):
Slightly cloudy, Brown tinge, no odour, no sheen, well in good condition

Discharge water disposal: Drums Sanitary sewer Storm sewer Surface Other

SAMPLING

SAMPLING METHOD

Same as purge method

Bailer - Type: PVC SS Teflon Other Pump - Type: PVC SS Teflon Other

SAMPLE DISTRIBUTION Sample Name:

Bottles:	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1	100 ml Amber	PAHs/TRH	unpreserved	ALS	
1	60 ml plastic	Metals	HNO ₃	ALS	field filtered? (Y) / N
2	40 ml VOA vials	BTEXN/VOCs/TRH	HCl	ALS	

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No

Ground Water Sampling Sheet

Job Name: ARTC Goulburn Roundhouse				Well No: MW 13				
Job Number: 20025.76				Well Type: <input checked="" type="checkbox"/> Monitor <input type="checkbox"/> Extractor <input type="checkbox"/> Other				
Recorded By: M.Wright				Well Material: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Other				
Date: 1/07/2021				Sample by: M.Wright				
PURGING								
PURGE VOLUME				PURGE METHOD				
Well Diameter (D in mm): <input checked="" type="checkbox"/> 50 <input type="checkbox"/> 100 <input type="checkbox"/> Other				<input type="checkbox"/> Bailer - Type: <input type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Teflon <input type="checkbox"/> Other <input checked="" type="checkbox"/> Pump - Type: <input type="checkbox"/> Submersible <input checked="" type="checkbox"/> Peristaltic <input type="checkbox"/> Other				
Total Depth of Well (TD in m BTOC): 9.024								
Water Level Depth WL in m BTOC): 4.338				PUMP INTAKE SETTING				
Number of well volumes to be purged (# VOLS) <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 10 <input type="checkbox"/> Other				Depth (m BTOC)				
				Screen Interval (m BTOC) - Top : Bottom:				
PURGE TIME 25 mins								
PURGE TIME _____ PURGE RATE 4.0 L ACTUAL PURGE								
VOLUME 2.5 L								
Start: Stop: Elapsed: Initial: Final:								
FIELD PARAMETER MEASUREMENTS								
Min since purge began	Volume Purged (L)	pH	Cond. (mS/cm)	Temp (°C)	DO (mg/L)	Redox (mV)	SWL (mBTOC)	Other (e.g. observations)
5	0.5	7.71	645	14.62	5.43	-7.2	4.391	
10	1.0	7.70	649	14.69	4.84	-8.1	4.390	
15	1.5	7.69	659	14.70	5.44	-10.6	4.389	
20	2.0	7.67	649	14.69	5.37	-10.6	4.387	
25	2.5	7.66	649	14.73	5.12	-10.6	4.386	
SAMPLING								
SAMPLING METHOD				<input checked="" type="checkbox"/> Same as purge method				
<input type="checkbox"/> Bailer - Type: <input type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Teflon <input type="checkbox"/> Other				<input type="checkbox"/> Pump - Type: <input type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> Teflon <input type="checkbox"/> Other				
SAMPLE DISTRIBUTION Sample Name:								
Bottles:	Vol/Cont.	Analysis	Preservatives	Lab	Comments			
1	100 ml Amber	PAHs/TRH	unpreserved	ALS				
1	60 ml plastic	Metals	HNO ₃	ALS	field filtered? (Y) / N			
2	40 ml VOA vials	BTEXN/VOCs/TRH	HCl	ALS				
QUALITY CONTROL SAMPLES								
Duplicate Samples		Blank Samples		Other Samples				
Original No	Duplicate No	Type	Sample No	Type	Sample No			
 		 		 				

Photoionisation Detector Calibration Record

Job Ref.....20025-76

Location.....Gailburn
Ranchhouse

Personnel.....MW

Serial Number	Date	Time	Span gas conc' (e.g 100 ppm isobutylene)	Span gas reading	Fresh air Cal reading	Initials
SN-592-90588	6.7.21	07:00	100 ppm	101 ppm	0.0 ppm	MW
" "	7.7.21	07:00	100 ppm	100 ppm	0.0 ppm	MW
xx at						



Equipment Calibration Report

HAN Water Quality Meter 98194-4M- Serial No. 0404000101

pH	<input checked="" type="checkbox"/> pH 6.86	Actual: <u>6.90</u>
Conductivity	<input checked="" type="checkbox"/> 5,000 uS/cm	Actual: <u>5010</u>
Dissolved oxygen	<input type="checkbox"/> 0.0 mg/L	Actual: <u> </u>
Redox Potential	<input checked="" type="checkbox"/> 240 mV	Actual: <u>240</u>
Temperature, (i.e. Room temperature):	<u>10.0°C</u>	

Calibrated by: M. Welford

Date tested: 5/7/21

Job Reference: 20025.76

Notes: NIH.

Equipment Calibration Report

HAN Water Quality Meter 98194-4M- Serial No. 0404000101

pH	<input checked="" type="checkbox"/> pH 6.86	Actual: <u>6.91</u>
Conductivity	<input checked="" type="checkbox"/> 5,000 uS/cm	Actual: <u>5000</u>
Dissolved oxygen	<input type="checkbox"/> 0.0 mg/L	Actual: <u>/</u>
Redox Potential	<input checked="" type="checkbox"/> 240 mV	Actual: <u>240</u>
Temperature, (i.e. Room temperature):	<u>10.50c</u>	

Calibrated by:

M. Widdiford

Date tested:

7/7/21

Job Reference:

20025.76

Notes:

N/A.

Equipment Calibration Report

HAN Water Quality Meter 98194-4M- Serial No. 0404000101

pH	<input checked="" type="checkbox"/> pH 6.86	Actual: <u>6.87</u>
Conductivity	<input checked="" type="checkbox"/> 5,000 uS/cm	Actual: <u>5,020</u>
Dissolved oxygen	<input type="checkbox"/> 0.0 mg/L	Actual: <u> </u>
Redox Potential	<input checked="" type="checkbox"/> 240 mV	Actual: <u>238</u>
Temperature, (i.e. Room temperature):	<u>2.5°C</u>	

Calibrated by:

M. Wright

Date tested:

8/7/21

Job Reference:

20025-76

Notes:

N/A.

Appendix B

Borehole and Testpit Logs

Monitoring Well Log

Project Name: Additional Environmental Site Assessment Location / Site: Goulburn Roundhouse, 12 Braidwood Rd, Goulburn NSW Client: Australian Rail Track Corporation Contractor: Campbell Drilling Method: Solid Flight Auger Rig Type: D-4T	Hole ID: MW09 Project Number: 20025.76 Hole Depth: 9.00 m
Date Started: 09/06/2021 Ground Level: ----- Date Completed: 09/06/2021 Easting: ----- Sheet: 1 of 1 Northing: ----- Zone: -----	

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples		Observations / Comments	Well Details	Well Construction
									PID ppm	ID No.			
							<i>Surface: Gravel</i>						
		1.50					FILL - Sandy GRAVEL, black, loose, fine to coarse grained sand, fine to coarse gravel.	dry	3.4	MW09/0.0-0.05	No hydrocarbon odour. No Staining. Ash mixed with fill.		
		2.00					Sandy CLAY - brown, soft, low plasticity, fine to coarse grained sand.	sat'd	0.2	MW09/0.9-1.0	No hydrocarbon odour. No Staining.		
		3.00					CLAY - brown, medium stiff, medium plasticity.	slightly moist	0.0	MW09/1.9-2.0	No hydrocarbon odour. No Staining.		
		3.90					CLAY - brown, medium stiff, medium plasticity.	slightly moist	0.0	MW09/2.9-3.0	No hydrocarbon odour. No Staining.		
		4.00					CLAY - brown, medium stiff, medium plasticity.	slightly moist	0.0	MW09/3.9-4.0	No hydrocarbon odour. No Staining.		
		5.00					CLAY - brown, medium stiff, medium plasticity.	slightly moist	0.0	MW09/4.9-5.0	No hydrocarbon odour. No Staining.		
		6.00					CLAY - brown, medium stiff, medium plasticity.	slightly moist	0.0	MW09/5.9-6.0	No hydrocarbon odour. No Staining.		
		7.00					Gravelly CLAY - brown, medium stiff, medium plasticity, fine to coarse gravel.	moist	0.0	MW09/6.9-7.0	No hydrocarbon odour. No Staining.		
		7.90					Gravelly CLAY - brown, medium stiff, medium plasticity, fine to coarse gravel.	moist	0.0	MW09/7.9-8.0	No hydrocarbon odour. No Staining.		
		8.00					Gravelly CLAY - brown, medium stiff, medium plasticity, fine to coarse gravel.	moist	0.0	MW09/8.9-9.0	No hydrocarbon odour. No Staining.		
		9.00					Terminated at 9.00 m Target depth.		0.0	MW09/8.9-9.0	No hydrocarbon odour. No Staining.		

Additional Comments

Monitoring Well installed in gap between timber sleepers.
Well developed by bailer 09/06/2021.

	Log Drawn By: Laurie White Contact: laurie.white@reumad.com.au	Logged By: Michael Wright Checked By:	Date: 09/06/2021 Date:
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CCLOG2021_20025_76 GOULBURN.GPJ CC.GDT 8/13/21 11:08:05 AM - drawn by laurie white at www.reumad.com.au

Monitoring Well Log

Project Name: Additional Environmental Site Assessment Location / Site: Goulburn Roundhouse, 12 Braidwood Rd, Goulburn NSW Client: Australian Rail Track Corporation Contractor: Campbell Drilling Method: Solid Flight Auger Rig Type: D-4T	Hole ID: MW10 Project Number: 20025.76 Hole Depth: 8.00 m
Date Started: 09/06/2021 Ground Level: ----- Date Completed: 09/06/2021 Easting: ----- Sheet: 1 of 1 Northing: ----- Zone: -----	

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples		Observations / Comments	Well Details	Well Construction
									PID ppm	ID No.			
SFA	0.10	0.20					FILL - Sandy GRAVEL, brown, loose, fine to coarse grained sand, fine to coarse gravel.	dry dry	0.0	MW10/0.0-0.05	No hydrocarbon odour. No Staining.		Gate
	0.80						CONCRETE.				No hydrocarbon odour. No Staining.		Grout
						CL	FILL - Sandy GRAVEL, brown, loose, fine to coarse grained sand, fine to coarse gravel. Sandy CLAY - brown / orange, soft, low plasticity, fine to coarse grained sand.	slightly moist	0.0	MW10/0.9-1.0	No hydrocarbon odour. No Staining.		
						CL			0.0	MW10/1.9-2.0			Bentonite
							CLAY - brown, medium stiff, medium plasticity.	slightly moist	0.0	MW10/2.9-3.0	No hydrocarbon odour. No Staining.		
						Natural			0.0	MW10/3.9-4.0			
						CL			0.0	MW10/4.9-5.0			Sand
						CL			0.0	MW10/5.9-6.0			
		6.90	7.20			CL	Sandy CLAY - brown, medium stiff, low plasticity, fine to coarse grained sand.	moist	0.4	MW10/6.9-7.0	Slight hydrocarbon odour. No Staining.		
						CL	Gravelly CLAY - brown, medium stiff, medium plasticity, fine to coarse gravel.	very moist			Slight hydrocarbon odour. No Staining.		
		8.00				Terminated at 8.00 m Target depth.		0.4	MW10/7.9-8.0			Screen	

Additional Comments

Monitoring Well installed between two concrete slabs.
Well developed by bailer 09/06/2021.

	Log Drawn By: Laurie White Contact: laurie.white@reumad.com.au	Logged By: Michael Wright Checked By:	Date: 09/06/2021 Date:
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CCLOG2021_20025_76 GOULBURN.GPJ CC.GDT 8/13/21 11:08:06 AM - drawn by laurie.white at www.reumad.com.au

Monitoring Well Log

Project Name: Additional Environmental Site Assessment Location / Site: Goulburn Roundhouse, 12 Braidwood Rd, Goulburn NSW Client: Australian Rail Track Corporation Contractor: Campbell Drilling Method: Solid Flight Auger Rig Type: D-4T	Hole ID: MW11 Project Number: 20025.76 Hole Depth: 9.00 m
Date Started: 09/06/2021 Ground Level: ----- Date Completed: 09/06/2021 Easting: ----- Sheet: 1 of 1 Northing: ----- Zone: -----	

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples		Observations / Comments	Well Details	Well Construction
									PID ppm	ID No.			
		-0.05				Fill	BITUMEN.	slightly moist	0.0	MW11/0.05-0.1 QS03, QS04	No hydrocarbon odour. No Staining.		
		0.70				CL	FILL - Sandy GRAVEL, brown, loose, fine to coarse grained sand, fine to coarse gravel.	sat'd	0.0	MW11/0.9-1.0	No hydrocarbon odour. No Staining.		
		1				CL	Sandy CLAY - brown, soft, low plasticity, fine to coarse grained sand.	slightly moist	0.0	MW11/1.9-2.0	No hydrocarbon odour. No Staining.		
		1.80				CL	Sandy CLAY - brown / orange, soft, low plasticity, fine to coarse grained sand.	slightly moist	0.0	MW11/2.9-3.0	No hydrocarbon odour. No Staining.		
		2											
		3											
		3.70											
		4				Natural	CLAY - brown, medium stiff, medium plasticity.	slightly moist	0.0	MW11/3.9-4.0	No hydrocarbon odour. No Staining.		
		5							0.0	MW11/4.9-5.0			
		6				CL			0.0	MW11/5.9-6.0			
		7							0.0	MW11/6.9-7.0			
		8							0.0	MW11/7.9-8.0			
		8.50				CL	Gravelly CLAY - brown, medium stiff, medium plasticity, fine to coarse gravel.	moist	0.0	MW11/8.9-9.0	No hydrocarbon odour. No Staining.		
		9.00					Terminated at 9.00 m Target depth.						
		10											

Additional Comments

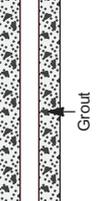
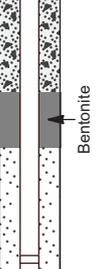
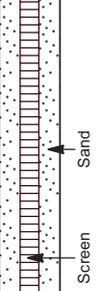
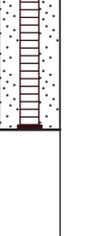
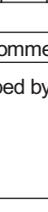
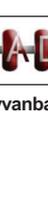
Well developed by bailer 09/06/2021.

	Log Drawn By: Laurie White Contact: laurie.white@reumad.com.au	Logged By: Michael Wright Checked By:	Date: 09/06/2021 Date:
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CCLOG2021_20025_76 GOULBURN.GPJ CC.GDT 8/13/21 11:08:08 AM - drawn by laurie white at www.reumad.com.au

Monitoring Well Log

Project Name: Additional Environmental Site Assessment Location / Site: Goulburn Roundhouse, 12 Braidwood Rd, Goulburn NSW Client: Australian Rail Track Corporation Contractor: Campbell Drilling Method: Solid Flight Auger Rig Type: D-4T	Hole ID: MW12 Project Number: 20025.76 Hole Depth: 9.00 m
Date Started: 08/06/2021 Ground Level: ----- Date Completed: 08/06/2021 Easting: ----- Sheet: 1 of 1 Northing: ----- Zone: -----	

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples		Observations / Comments	Well Details	Well Construction
									PID ppm	ID No.			
							Surface: Gravel						
		0.80				Fill	FILL - Clayey Sandy GRAVEL, black / brown, loose, fine to coarse grained sand, fine to coarse gravel.	slightly moist	0.0	MW12/0.0-0.05 QS01, QS02	No hydrocarbon odour. No Staining.		Gravel
		1.00			CL	Natural	Sandy CLAY - brown / orange, soft, medium plasticity, fine to coarse grained sand.	moist	0.0	MW12/0.9-1.0	No hydrocarbon odour. No Staining.		Grout
		2.70			CL	Natural	CLAY - brown, medium stiff, medium plasticity.	slightly moist	0.0	MW12/1.9-2.0	No hydrocarbon odour. No Staining.		Grout
		3.50			CL	Natural	CLAY - brown, medium stiff, medium plasticity.	slightly moist	0.0	MW12/2.9-3.0	No hydrocarbon odour. No Staining.		Bentonite
		4.00			CL	Natural	CLAY - brown, medium stiff, medium plasticity, fine to coarse gravel.	moist	0.0	MW12/3.9-4.0	No hydrocarbon odour. No Staining.		Bentonite
		5.00			CL	Natural	CLAY - brown, medium stiff, medium plasticity, fine to coarse gravel.	moist	0.0	MW12/4.9-5.0	No hydrocarbon odour. No Staining.		Sand
		6.00			CL	Natural	CLAY - brown, medium stiff, medium plasticity, fine to coarse gravel.	moist	0.0	MW12/5.9-6.0	No hydrocarbon odour. No Staining.		Sand
		7.00			CL	Natural	CLAY - brown, medium stiff, medium plasticity, fine to coarse gravel.	moist	0.0	MW12/6.9-7.0	No hydrocarbon odour. No Staining.		Screen
		8.00			CL	Natural	CLAY - brown, medium stiff, medium plasticity, fine to coarse gravel.	moist	0.0	MW12/7.9-8.0	No hydrocarbon odour. No Staining.		Screen
		9.00			CL	Natural	Terminated at 9.00 m Target depth.		0.0	MW12/8.9-9.0			Screen
		10.00											

Additional Comments

Well developed by bailer 09/06/2021.

	Log Drawn By: Laurie White Contact: laurie.white@reumad.com.au	Logged By: Michael Wright Checked By:	Date: 08/06/2021 Date:
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CCLOG2021_20025_76 GOULBURN.GPJ CC.GDT 8/13/21 11:08:10 AM - drawn by laurie white at www.reumad.com.au

Monitoring Well Log

Project Name: Additional Environmental Site Assessment Location / Site: Goulburn Roundhouse, 12 Braidwood Rd, Goulburn NSW Client: Australian Rail Track Corporation Contractor: Campbell Drilling Method: Solid Flight Auger Rig Type: D-4T	Hole ID: MW13 Project Number: 20025.76 Hole Depth: 9.00 m
Date Started: 08/06/2021 Ground Level: ----- Date Completed: 08/06/2021 Easting: ----- Sheet: 1 of 1 Northing: ----- Zone: -----	

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples		Observations / Comments	Well Details	Well Construction
									PID ppm	ID No.			
							Surface: Grass						
		0.40			Fill	Fill	FILL - Clayey Sandy GRAVEL, black / brown, loose, fine to coarse grained sand, fine to coarse gravel.	slightly moist	0.1	MW13/0.0-0.05	No hydrocarbon odour. No Staining. Ash mixed with fill.		
					CL	Sandy CLAY	Sandy CLAY - brown, soft, low plasticity, fine to coarse grained sand.	moist	0.0	MW13/0.4-0.5			
		1.50			CL	Sandy CLAY	Sandy CLAY - brown mottled orange, medium soft, medium plasticity, fine to coarse grained sand.	slightly moist	0.0	MW13/0.9-1.0		No hydrocarbon odour. No Staining.	
		2.10			CL	CLAY	CLAY - brown, medium stiff, medium plasticity.	slightly moist	0.0	MW13/1.9-2.0	No hydrocarbon odour. No Staining.		
					CL	Natural			0.0	MW13/2.9-3.0	No hydrocarbon odour. No Staining.		
					CL	Natural			0.0	MW13/3.9-4.0			
		4.80			CL	Natural			0.0	MW13/4.9-5.0	No hydrocarbon odour. No Staining.		
					CL	Natural			0.0	MW13/5.9-6.0			
					CL	Natural			0.0	MW13/6.9-7.0			
					CL	Natural			0.0	MW13/7.9-8.0			
		9.00							0.0	MW13/8.9-9.0			
							Terminated at 9.00 m Target depth.						

Additional Comments

Well developed by bailer 09/06/2021.

	Log Drawn By: Laurie White Contact: laurie.white@reumad.com.au	Logged By: Michael Wright Checked By:	Date: 08/06/2021 Date:
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CCLOG2021_20025_76 GOULBURN.GPJ CC.GDT 8/13/21 11:08:11 AM - drawn by laurie white at www.reumad.com.au

Test Pit Log

Project Name: Additional Environmental Site Assessment	Hole ID: TP16
Location / Site: Goulburn Roundhouse, 12 Braidwood Rd, Goulburn NSW	Project Number: 20025.76
Client: Australian Rail Track Corporation	Hole Depth: 1.00 m
Contractor: M&M Earthworks	
Method: Excavation Rig Type: 3.5T excavator	
Date Started: 06/07/2021	Ground Level: -----
Date Completed: 06/07/2021	Easting: -----
Sheet: 1 of 1	Northing: -----
	Zone: -----

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples		Observations / Comments
									PID ppm	ID No.	
							Surface: Grass				
EX		0.2				Fill	FILL - Silty CLAY, dark brown, soft, low plasticity.	slightly moist	0.0	TP16/0.0-0.05 QS05, QS06	No hydrocarbon odour. No Staining. Ash mixed with fill.
		0.30					FILL - Sandy GRAVEL, black, loose, fine to coarse grained sand, fine to coarse gravel.	slightly moist	0.0	TP16/0.3-0.4	No hydrocarbon odour. No Staining.
		0.40			CL	Natural	Silty CLAY - brown, soft, low plasticity.	slightly moist			No hydrocarbon odour. No Staining.
		0.6					Sandy CLAY - light brown, medium stiff, medium plasticity, fine to coarse grained sand.	slightly moist			No hydrocarbon odour. No Staining.
		0.70									
		0.8									
		1.00					Terminated at 1.00 m Target depth.				
		1.2									
		1.4									
		1.6									
		1.8									
		2.0									
		2.2									
		2.4									
		2.6									
		2.8									
		3.0									

Additional Comments

	Log Drawn By: Laurie White	Logged By: Michael Wright	Date: 06/07/2021
	Contact: laurie.white@reumad.com.au	Checked By:	Date:

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Test Pit Log

Project Name: Additional Environmental Site Assessment	Hole ID: TP21
Location / Site: Goulburn Roundhouse, 12 Braidwood Rd, Goulburn NSW	Project Number: 20025.76
Client: Australian Rail Track Corporation	Hole Depth: 2.00 m
Contractor: M&M Earthworks	
Method: Excavation Rig Type: 3.5T excavator	
Date Started: 06/07/2021	Ground Level: -----
Date Completed: 06/07/2021	Easting: -----
Sheet: 1 of 1	Northing: -----
	Zone: -----

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples		Observations / Comments
									PID ppm	ID No.	
							<i>Surface: Gravel</i>				
EX		0.2			Fill	Fill	FILL - Clayey Sandy GRAVEL, light brown, loose, fine to coarse grained sand, fine to coarse gravel.	slightly moist	0.0	TP21/0.0-0.05	No hydrocarbon odour. No Staining. Roadbase.
		0.40					FILL - Clayey SAND, black, loose, fine to coarse grained sand.	slightly moist	0.0	TP21/0.4-0.5	No hydrocarbon odour. No Staining.
		0.6					FILL - Sandy GRAVEL, black, loose, fine to coarse grained sand, fine to coarse gravel.	slightly moist	0.0	TP21/0.9-1.0	No hydrocarbon odour. No Staining. Ash.
		0.80			Natural	CL	Silty CLAY - brown, soft, low plasticity.	slightly moist	0.0	TP21/1.4-1.5	No hydrocarbon odour. No Staining.
		1.0					Sandy CLAY - light brown, medium stiff, medium plasticity, fine to coarse grained sand.	moist			No hydrocarbon odour. No Staining.
	1.20										
	1.4										
	1.6										
	1.80										
	2.00						Terminated at 2.00 m Target depth.				
	2.2										
	2.4										
	2.6										
	2.8										
	3.0										

Additional Comments

	Log Drawn By: Laurie White	Logged By: Michael Wright	Date: 06/07/2021
	Contact: laurie.white@reumad.com.au	Checked By:	Date:

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Test Pit Log

Project Name: Additional Environmental Site Assessment	Hole ID: TP23
Location / Site: Goulburn Roundhouse, 12 Braidwood Rd, Goulburn NSW	Project Number: 20025.76
Client: Australian Rail Track Corporation	Hole Depth: 2.30 m
Contractor: M&M Earthworks	
Method: Excavation Rig Type: 3.5T excavator	
Date Started: 06/07/2021	Ground Level: -----
Date Completed: 06/07/2021	Easting: -----
Sheet: 1 of 1	Northing: -----
	Zone: -----

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples		Observations / Comments		
									PID ppm	ID No.			
							Surface: Grass						
EX		0.2				Fill	FILL - Clayey Sandy GRAVEL, brown, loose, fine to coarse grained sand, fine to coarse gravel.	slightly moist	0.0	TP23/0.0-0.05 QS01, QS02	No hydrocarbon odour. No Staining.		
		0.30					FILL - Clayey Sandy GRAVEL, brown, loose, fine to coarse grained sand, fine to coarse gravel.	slightly moist			No hydrocarbon odour. No Staining. Mixed with rubbish, glass bottles, bricks, steel.		
		0.4									0.0	TP23/0.9-1.0	
		0.6											
		0.8											
		1.0											
		1.2											
		1.40					FILL - Sandy GRAVEL, black / grey, loose, fine to coarse grained sand, fine to coarse gravel.	dry	0.0	TP23/1.4-1.5	No hydrocarbon odour. No Staining.		
		1.6											
		1.80											
		2.0			CL	Natural	Silty CLAY - brown, soft, low plasticity.	slightly moist	0.0	TP23/1.9-2.0	No hydrocarbon odour. No Staining.		
		2.2											
		2.30											
		2.4					Terminated at 2.30 m Target depth.						
		2.6											
		2.8											
		3.0											

Additional Comments

	Log Drawn By: Laurie White	Logged By: Michael Wright	Date: 06/07/2021
	Contact: laurie.white@reumad.com.au	Checked By:	Date:

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Test Pit Log

Project Name: Additional Environmental Site Assessment	Hole ID: TP24
Location / Site: Goulburn Roundhouse, 12 Braidwood Rd, Goulburn NSW	Project Number: 20025.76
Client: Australian Rail Track Corporation	Hole Depth: 1.00 m
Contractor: M&M Earthworks	
Method: Excavation Rig Type: 3.5T excavator	
Date Started: 06/07/2021	Ground Level: -----
Date Completed: 06/07/2021	Easting: -----
Sheet: 1 of 1	Northing: -----
	Zone: -----

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples		Observations / Comments
									PID ppm	ID No.	
							<i>Surface: Gravel</i>				
EX		0.10				Fill	FILL - Clayey Sandy GRAVEL, brown, loose, fine to coarse grained sand, fine to coarse gravel.	slightly moist	0.0	TP24/0.0-0.05	No hydrocarbon odour. No Staining.
		0.2	FILL - Clayey SAND, black, loose, fine to coarse grained sand.				slightly moist			No hydrocarbon odour. No Staining. Ash mixed with fill.	
		0.40			CL	Natural	Silty CLAY - brown, soft, low plasticity.	slightly moist	0.0	TP24/0.4-0.5	No hydrocarbon odour. No Staining.
		0.6					Sandy CLAY - light brown, medium stiff, medium plasticity, fine to coarse grained sand.	moist			No hydrocarbon odour. No Staining.
		0.70									
		0.8									
		1.00					Terminated at 1.00 m Target depth.		0.0	TP24/0.9-1.0	
		1.2									
		1.4									
		1.6									
		1.8									
		2.0									
		2.2									
		2.4									
		2.6									
		2.8									
		3.0									

Additional Comments

	Log Drawn By: Laurie White	Logged By: Michael Wright	Date: 06/07/2021
	Contact: laurie.white@reumad.com.au	Checked By:	Date:

Test Pit Log

Project Name: Additional Environmental Site Assessment	Hole ID: TP26
Location / Site: Goulburn Roundhouse, 12 Braidwood Rd, Goulburn NSW	Project Number: 20025.76
Client: Australian Rail Track Corporation	Hole Depth: 1.50 m
Contractor: M&M Earthworks	
Method: Excavation Rig Type: 3.5T excavator	
Date Started: 06/07/2021	Ground Level: -----
Date Completed: 06/07/2021	Easting: -----
Sheet: 1 of 1	Northing: -----
	Zone: -----

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples		Observations / Comments
									PID ppm	ID No.	
							Surface: Grass				
EX		0.2			Fill		FILL - Clayey SAND, black, loose, fine to coarse grained sand.	slightly moist	0.0	TP26/0.0-0.05	No hydrocarbon odour. No Staining. Trace ballast.
		0.40	CL				Silty CLAY - brown, soft, low plasticity.	slightly moist	0.0	TP26/0.4-0.5	No hydrocarbon odour. No Staining.
		0.70	CL				Sandy CLAY - light brown, medium stiff, medium plasticity, fine to coarse grained sand.	moist	0.0	TP26/0.9-1.0	No hydrocarbon odour. No Staining.
		0.8									
		1.0									
		1.2									
		1.4									
		1.50					Terminated at 1.50 m Target depth.				
		1.6									
		1.8									
		2.0									
		2.2									
		2.4									
		2.6									
		2.8									
		3.0									

Additional Comments

	Log Drawn By: Laurie White	Logged By: Michael Wright	Date: 06/07/2021
	Contact: laurie.white@reumad.com.au	Checked By:	Date:

Test Pit Log

Project Name: Additional Environmental Site Assessment	Hole ID: TP27
Location / Site: Goulburn Roundhouse, 12 Braidwood Rd, Goulburn NSW	Project Number: 20025.76
Client: Australian Rail Track Corporation	Hole Depth: 1.70 m
Contractor: M&M Earthworks	
Method: Excavation Rig Type: 3.5T excavator	
Date Started: 06/07/2021	Ground Level: -----
Date Completed: 06/07/2021	Easting: -----
Sheet: 1 of 1	Northing: -----
	Zone: -----

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples		Observations / Comments
									PID ppm	ID No.	
							Surface: Grass				
EX		0.2				Fill	FILL - Clayey Sandy GRAVEL, brown / black, loose, fine to coarse grained sand, fine to coarse gravel.	slightly moist	0.2	TP27/0.0-0.05	No hydrocarbon odour. No Staining. Glass fragments, bricks, rubbish from 0.2m.
		0.40					FILL - Sandy GRAVEL, black, loose, fine to coarse grained sand, fine to coarse gravel.	slightly moist	0.0	TP27/0.4-0.5	No hydrocarbon odour. No Staining. Ash mixed with fill. Glass fragments, bricks, rubbish to 1.0m.
		0.6				Natural	Silty CLAY - brown, soft, low plasticity.	slightly moist	0.0	TP27/1.4-1.5	No hydrocarbon odour. No Staining.
		1.30									
		1.4									
		1.6									
		1.70									
		1.8					Terminated at 1.70 m Target depth.				
		2.0									
		2.2									
		2.4									
		2.6									
		2.8									
		3.0									

Additional Comments

	Log Drawn By: Laurie White	Logged By: Michael Wright	Date: 06/07/2021
	Contact: laurie.white@reumad.com.au	Checked By:	Date:

Test Pit Log

Project Name: Additional Environmental Site Assessment	Hole ID: TP28
Location / Site: Goulburn Roundhouse, 12 Braidwood Rd, Goulburn NSW	Project Number: 20025.76
Client: Australian Rail Track Corporation	Hole Depth: 2.30 m
Contractor: M&M Earthworks	
Method: Excavation Rig Type: 3.5T excavator	
Date Started: 06/07/2021	Ground Level: -----
Date Completed: 06/07/2021	Easting: -----
Sheet: 1 of 1	Northing: -----
	Zone: -----

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples		Observations / Comments		
									PID ppm	ID No.			
							Surface: Grass						
EX		0.2				Fill	FILL - Clayey SAND, black, loose, fine to coarse grained sand.	slightly moist	0.0	TP28/0.0-0.05 QS03, QS04	No hydrocarbon odour. No Staining.		
		0.30											
		0.4								FILL - Clayey Sandy GRAVEL, black, loose, fine to coarse grained sand, fine to coarse gravel.	slightly moist		
		0.6							0.0	TP28/0.9-1.0			
		0.8											
		1.0											
		1.2											
		1.4											
		1.6											
		1.80											
		2.0			CL	Natural	Sandy CLAY - light brown, medium stiff, medium plasticity, fine to coarse grained sand.	moist	0.0	TP28/1.9-2.0	No hydrocarbon odour. No Staining.		
		2.2											
		2.30											
		2.4					Terminated at 2.30 m Target depth.						
		2.6											
		2.8											
		3.0											

Additional Comments

	Log Drawn By: Laurie White	Logged By: Michael Wright	Date: 06/07/2021
	Contact: laurie.white@reumad.com.au	Checked By:	Date:

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Test Pit Log

Project Name: Additional Environmental Site Assessment	Hole ID: TP44
Location / Site: Goulburn Roundhouse, 12 Braidwood Rd, Goulburn NSW	Project Number: 20025.76
Client: Australian Rail Track Corporation	Hole Depth: 1.50 m
Contractor: M&M Earthworks	
Method: Excavation Rig Type: 3.5T excavator	
Date Started: 07/07/2021	Ground Level: -----
Date Completed: 07/07/2021	Easting: -----
Sheet: 1 of 1	Northing: -----
	Zone: -----

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples		Observations / Comments
									PID ppm	ID No.	
							Surface: Grass				
EX		0.20			Fill	Fill	FILL - Sandy GRAVEL, black, loose, fine to coarse grained sand, fine to coarse gravel.	slightly moist	0.0	TP44/0.0-0.05	No hydrocarbon odour. No Staining.
		0.4					FILL - Sandy GRAVEL, black, loose, fine to coarse grained sand, fine to coarse gravel.	slightly moist	0.0	TP44/0.4-0.5	No hydrocarbon odour. No Staining. Ash.
		0.60			CL	Natural	Silty CLAY - brown, soft, low plasticity.	slightly moist	0.0	TP44/0.6-0.7	No hydrocarbon odour. No Staining.
		0.80					Sandy CLAY - light brown, medium stiff, medium plasticity, fine to coarse grained sand.	slightly moist	0.0		No hydrocarbon odour. No Staining.
		1.0									
		1.2									
		1.4									
		1.50									
		1.6					Terminated at 1.50 m Target depth.				
		1.8									
		2.0									
		2.2									
		2.4									
		2.6									
		2.8									
		3.0									

Additional Comments

	Log Drawn By: Laurie White	Logged By: Michael Wright	Date: 07/07/2021
	Contact: laurie.white@reumad.com.au	Checked By:	Date:

Appendix C

Data Usability Assessment

Data Usability Summary Assessment

A background to data usability is provided in this appendix. All site work was completed in accordance with standard Cavvanba sampling protocols, including a quality assurance/quality control (QA/QC) programme and standard operating procedures.

A data usability assessment was performed for all soil and groundwater data collected by Cavvanba, as summarised in the following tables:

- Table 1.1: Field QC samples summary;
- Table 1.2: Summary of field QA/QC; and
- Table 1.3: Summary of laboratory QA/QC.

This data usability assessment was conducted on laboratory batch numbers ES2121889, ES2125433, ES2125612, ES2125613, ES2126823, 802648, 810223.

Table 1.1: Field QC samples summary

	Total samples	Field duplicates ¹	Inter-lab duplicates ¹	Trip spike	Trip blank
<i>Soil</i>					
BTEXN	10	1 (10.00%)	1 (10.00%)	2	2
TRH C ₆ – C ₁₀	10	1 (10.00%)	1 (10.00%)	2	2
TRH C ₁₀ – C ₄₀	10	1 (10.00%)	1 (10.00%)	-	-
Metals ¹	10	1 (10.00%)	1 (10.00%)	-	-
Lead	65	8 (12.3%)	8 (12.3%)	-	-
PAHs	10	1 (10.00%)	1 (10.00%)	-	-
OCPs / OPPs / PCBs	10	0 (0%)	0 (0%)	-	-
Asbestos	1	0 (0%)	0 (0%)	-	-
<i>Groundwater</i>					
BTEXN	15	1 (6.66%)	1 (6.66%)	1	1
TRH C ₆ – C ₁₀	15	1 (6.66%)	1 (6.66%)	1	1
TRH C ₁₀ – C ₄₀	15	1 (6.66%)	1 (6.66%)	-	-
Metals ¹	15	1 (6.66%)	1 (6.66%)	-	-
PAHs	15	1 (6.66%)	1 (6.66%)	-	-
VOCs	15	1 (6.66%)	1 (6.66%)	-	-

Notes:

- ¹. Seven (7) metals including arsenic, cadmium, chromium, copper, nickel, zinc and mercury.
 – = not applicable, as trip spike/blank analysed for volatile compounds only.

Table 1.2: Summary of field QA/QC

Parameter	Complies	Comments ¹
<i>Precision</i>		
Standard operating procedures (SOPs) appropriate and complied with	Yes	Sampling was conducted in accordance with Cavanba standard field operating procedures and project DQOs. The sampling methods complied with industry standards and guidelines.
Field duplicates	Yes	RPD ² criteria < 30% – 50%, frequency ≥ 5%. No RPD exceedances were reported for field duplicates. The frequency of field duplicates were within the acceptable range.
Inter-laboratory duplicates	Yes	RPD ² criteria < 30% – 50%, frequency ≥ 5%. No RPD exceedances were reported for inter-laboratory duplicates. The frequency of inter-laboratory duplicates were within the acceptable range.
<i>Accuracy</i>		
Matrix spikes samples appropriate	Yes	≥ 1/media type.
<i>Representativeness</i>		
Sample collection - preservation	Yes	All samples were collected directly into laboratory supplied jars/bottles with no headspace. All samples were placed immediately into eskies containing ice.
Sample collection - sample splitting	Yes	Duplicate samples were split in the field by filling each container collectively (i.e. co-collected).
Field equipment calibrated	Yes	PID and groundwater multi-parameter probe calibration records are included as an appendix to the report.
Decontamination procedures	Yes	Groundwater samples were collected using single use disposable tubing. Decontamination of the interface probe was conducted between each monitoring well location. No other re-usable groundwater sampling equipment was used. Soil samples were collected in such a manner that the material sampled was not in direct contact with the sampling device. Field samplers also wore new disposable nitrile gloves during sampling and between each sample depth and location.
Rinsate samples	n/a	Required ≥ 1/field batch, < LORs. There were no rinsate samples collected during the course of the investigation.

Parameter	Complies	Comments ¹
Trip blanks	Yes	≥ 1/field batch (volatiles), < LORs. Trip blanks were collected for all sample batches submitted to the laboratory. Analytical results were reported below the laboratory LOR.
Trip spikes	Yes	≥ 1/field batch (volatiles), 70 - 130%, (recovery) or ≤ 30 - 50% (RPDs). Trip spikes were collected/analysed for the soil and groundwater samples, and RPDs were within acceptable limits.
<i>Comparability</i>		
Consistent sampling staff	Yes	All field work was conducted by Mr Michael Wright of Cavvanba Consulting.
Consistent weather/field conditions	Yes	No extreme weather conditions occurred during or before/after the investigation.
<i>Completeness</i>		
Sample logs and field data	Yes	Standard field sampling forms were used during the investigation.
Chain of Custody	Yes	-

Notes:

1. For QC samples, specified frequency and acceptance criteria shown.
2. RPD = relative percentage difference.

Table 1.3: Summary of laboratory QA/QC

Parameter	Complies	Notes ¹
<i>Precision</i>		
Laboratory duplicates	Partial	laboratory specified RPD range, frequency \geq 10%. Laboratory duplicate recoveries were within the laboratory specified global acceptance criteria with the exception of select analytes. Laboratory frequency outliers were within the acceptable range with the exception of select analytes.
<i>Accuracy</i>		
Surrogate spikes	Yes	Organics by GC, RPD criteria of 70% - 130%. Surrogate spike recoveries were within the laboratory specified global acceptance criteria. The frequency of surrogate spikes were within the acceptable range.
Matrix spikes analysis appropriate	Partial	RPD criteria of \geq 70% - 130%. Matrix spike recoveries were within the laboratory specified global acceptance criteria with the exception of select analytes. Matrix spike frequency outliers were within the acceptable range with the exception of select analytes.
Laboratory control samples (LCSs)	Yes	RPD criteria of 70% - 130%, frequency of \geq 1/lab batch Laboratory control sample recoveries were within the laboratory specified global acceptance criteria. The frequency of laboratory control samples was within the acceptable range.
Certified reference material (CRM)	n/a	-
<i>Representativeness</i>		
Sample condition	Yes	-
Holding times	Yes	-
Laboratory blanks	Yes	\geq 1/lab batch, < LORs.
<i>Comparability</i>		
NATA accredited laboratory	Yes	ALS Environmental Pty Ltd is a NATA accredited laboratory (accreditation number 825). The inter-laboratory is also NATA accredited, Eurofins Scientific Pty Ltd (accreditation number 1261).

Parameter	Complies	Notes ¹
ASC NEPM 2013 methods or similar	Yes	ALS and Eurofins describe their in-house laboratory methods are referenced from NEPC, ASTM and modified USEPA/APHA documents.
Limits of reporting (LORs) are consistent and appropriate	Yes	-
<i>Completeness</i>		
Sample receipt	Yes	-
Laboratory Reports	Yes	-

Notes:

1. For QC samples, acceptance criteria shown. Acceptance criteria can vary based on analyte, statistical data and laboratory specific methods. Laboratory specified relates to detected concentrations based on LORs, e.g. result < 10 x LOR = no limit, 10 – 20 x LOR = 0 - 50%, > 20 x LOR = 0 - 20%. See laboratory reports for specific details.

Summary and discussion

The following issues were identified with the data:

Precision

No outliers have been reported for QC samples collected to assist in the qualification of precision.

Field duplicates, inter-laboratory duplicates and the frequency of field duplicates were within acceptable ranges.

Laboratory duplicate outliers were reported for select metals by the primary and inter-laboratory. It was reported by the primary laboratory that the RPD exceeds the LOR based limits and by the inter-laboratory that sample heterogeneity was the cause of the exceedance. Laboratory duplicate frequency outliers were also reported to be slightly outside of the acceptable ranges for PAHs / Phenols and TRH in the semi-volatile fractions. These reported outliers are considered to be acceptable and do not detract from the overall precision of the dataset.

Accuracy

There were no outliers reported for field QC samples collected to assist in the qualification of accuracy.

Surrogate spikes, matrix spikes and laboratory control sample recoveries were within acceptable ranges.

Matrix spike frequency outliers were reported to be slightly outside of the acceptable range for PAHs / Phenols and TRH in the semi-volatile fractions. These reported outliers are considered to be acceptable and do not detract from the overall accuracy of the dataset.

Representativeness

Trip spike recoveries were within the specified RPDs and trip blank recoveries were below the laboratory LORs.

Comparability

The data is considered to be acceptable, with experienced sampling staff, NATA accredited laboratories and all laboratory LORs below the relevant environmental criteria.

Completeness

Laboratory and field documentation is considered to be complete.

Background to Data Usability

1.0 Introduction

Information generated from environmental investigations requires some statement in regard to the usability of the data¹, and therefore quality assurance (QA) and quality control (QC) are an integral part of the analysis and interpretation of environmental data. QA/QC used in contaminated sites investigations is briefly reviewed in this section.

Quality assurance involves all of the actions, procedures, checks and decisions undertaken to ensure the representativeness and integrity of samples, and accuracy and reliability of analytical results (NEPC as amended 2013). Quality control is the component of QA which monitors and measures the effectiveness of other procedures by the comparison of these measures to previously decided objectives.

There are various components of QA/QC which address the operation of the laboratories and the routine procedures conducted to achieve a minimum level of quality. Examples of QA components include sample control, data transfer, instrument calibration, staff training, etc. Examples of QC components include the measurement of samples to access the quality of reagents and standards, cleanliness of apparatus, accuracy and precision of methods and instruments, etc. Generally, the management of laboratory QA issues is addressed through accreditation by the National Association of Testing Authorities (NATA), or similar, and monitoring of these issues is not addressed on a project by project basis.

On a project specific basis, those involved in collecting, assessing or reviewing the relevant data should ensure the minimum level of QA is conducted. Appropriate numbers and types of QC samples should be collected and analysed, both field QC samples and laboratory QC samples. While minimum levels of QA/QC are specified in some guidelines, e.g. NSW EPA 1994, AS 4482.1-1997, NEPC as amended 2013, the minimum level required may vary between projects, based on site and project specific aspects. This means that the minimum specified requirements may not be sufficient for a particular project. As described in the NEPM (NEPC 1999):

As a general rule, the level of required QC is that which adequately measures the effects of all possible influences upon sample integrity, accuracy and precision, and is capable of predicting their variation with a high degree of confidence.

2.0 PARCC parameters

Following receipt of laboratory analytical results, data validation is conducted to determine if the specified acceptance criteria have been met. This is conducted to ensure that all data, and subsequent decisions based on that data, are technically sound. Data quality is typically discussed in terms of precision, accuracy, representativeness, comparability and completeness. These are referred to as the PARCC parameters². Field QA/QC and laboratory QC is described below within the PARCC framework.

¹ To avoid confusion with the data quality objectives (DQOs) process, the term data usability is used rather than data quality.

² The PARCC parameters are sometimes referred to as data quality indicators (DQIs).

2.1 Precision

2.1.1 Duplicates

Precision is a measure of the reproducibility of results under a given set of conditions and is assessed on the basis of agreement between a set of duplicate results obtained from duplicate analyses. The precision of a duplicate determination is measured by comparing the difference between the two samples to the average of the two samples, expressed as a relative percentage difference (RPD).

The determination is:

$$\text{RPD} = (P-D)/(P+D/2) \times 100$$

P = primary sample
D = duplicate sample

Three types of duplicates are commonly used:

- field duplicates are used to measure the precision of the sampling and analytical process;
- inter-laboratory duplicates are used to check on the analytical performance of the primary laboratory; and
- laboratory duplicates are used to measure the precision of the analytical process.

2.1.2 Field Duplicates

Field duplicates (or blind replicates) are collected from the same location and submitted to the laboratory for analyses, as a primary sample. The sample nomenclature is such that the laboratory is not aware which sample is a duplicate. The RPD is calculated to determine the degree of repeatability (precision) of results obtained from the duplicate analysis. Where results are below the practical quantification limit (PQLs) or limits of reporting (LORs), i.e. non-detects, RPDs cannot be calculated. Where one result is detected, the results are considered to conform when the detected result is less than five times the PQL/LOR.

The PQL/LOR is the lowest concentration of an analyte that can be determined with acceptable precision (repeatability) and accuracy under the test conditions. The PQL/LOR is usually calculated as five times the lower limit of detection (or method detection limit). However, adjustments in PQLs/LORs may be required due to interference from high contaminant concentrations.

As environmental samples can exhibit a high degree of heterogeneity, field duplicates often exceed the acceptance criterion, particularly if the samples are co-collected, for example, because of the potential for losing volatiles during sample splitting. It is generally accepted that before results which fail the acceptance criterion are described as due to low concentrations or sample heterogeneity, the sample should be re-analysed. This may not be necessary when the analytical results are significantly less than the landuse criteria.

2.1.3 Inter-laboratory duplicates

Inter-laboratory duplicates (or split samples) are field duplicates which are sent to a second laboratory and analysed for the same analytes and, as far as possible, by the same methods. These provide a check on the analytical performance of the primary laboratory.

2.1.4 Laboratory Duplicates

Laboratory duplicates (or check samples) are field samples which are split by the laboratory and thereafter treated as separate samples. The RPD is calculated to determine the degree of repeatability (precision) of results obtained from the duplicate analysis.

USEPA (1994) specifies that for inorganics, if the results for laboratory duplicates fall outside of the recommended control limits for a particular analyte, all results for that analyte, in all associated samples of the same matrix, should be qualified as an estimated quantity. For organics, USEPA (1999) does not specify recommended actions for laboratory duplicates.

2.2 Accuracy

Accuracy is a measure of the agreement between an experimental determination and the true value of the parameter being measured. Inasmuch as the true sample concentrations are not known, the determination of accuracy is achieved through the analysis of known reference materials or assessed by the analysis of matrix spikes. Spiking of reference material into the actual sample matrix is the preferred technique because it provides a measure of the matrix effects on the analytical recovery.

Accuracy is measured in terms of percentage recovery as defined by:

$$\%R = ((SSR - SR) / SA) \times 100$$

%R = percentage recovery spike
SSR = spiked sample result
SR = sample result
SA = spike added

2.2.1 Matrix spikes/matrix spike duplicates

These are samples prepared in the laboratory by dividing a sample into two aliquots and then spiking each with identical concentrations of specific analytes. The matrix spike (MS) and matrix spike duplicate (MSD) are then analysed separately and the results compared to determine the accuracy and precision of the analytes.

2.2.2 Surrogate spikes

Surrogate spikes provide an indication of analytical accuracy. They are used only for analyses which use gas chromatography and are compounds which are similar to the organic analytes of interest in chemical composition, extraction and chromatography, but which are not normally found in field samples. Surrogates are generally spiked into all sample aliquots prior to preparation and analysis. If the surrogate spike recovery does not meet the prescribed acceptance criteria, the samples should be re-analysed.

2.2.3 Laboratory control samples

Laboratory control samples (quality control check samples) are laboratory prepared samples of an appropriate clean matrix (i.e. sand or distilled water) which are spiked with known concentrations of specific analytes. The laboratory control sample (LCS) is then analysed and the results are used to assess sample preparation and analytical accuracy, free of matrix effects. Certified reference material (CRM) is another form of LCS, and involves the analysis of a known standard as part of the laboratory batch, e.g. British Columbia sediment samples for analysis of metals.

2.3 Representativeness

Representativeness refers to the degree to which the samples reflect the site specific conditions. It is primarily dependent on the design and implementation of the sampling program, with representativeness of the data being partially ensured by the avoidance of cross-contamination, adherence to sample handling and analytical methods, use of field duplicates, ensuring that samples do not exceed holding times prior to analysis, use of chain-of-custody forms and other appropriate documentation.

There are a number of QC samples which can be collected to assist in the qualification of representativeness, including:

2.3.1 Rinsate blanks

Used to determine if sampling equipment has been adequately decontaminated to ensure that cross-contamination between samples has not occurred. The frequency for rinsate blanks is one per piece of equipment per day (AS 4482.1-1997), however it should be noted that cross-contamination will bias samples upwards, and the frequency should therefore be at the investigators discretion.

2.3.2 Trip blanks

Used only when volatile organics are sampled to determine if transport in motor vehicles or similar has resulted in contamination of the samples. For trip blanks, a sufficient number should be analysed to allow the representativeness of the sampling to be determined. However, it should be noted that cross-contamination will bias samples upwards, and the frequency should therefore be at the investigators discretion.

2.3.3 Trip spikes

Used only when volatile organics are sampled to attempt to quantify loss of volatiles during the analytical process. For trip spikes, a sufficient number of samples should be analysed to allow qualification of the likely loss of volatiles during the field sampling.

2.3.4 Laboratory blanks

Laboratory blanks (or method blanks, or analysis blanks) are used to verify that contaminants are not introduced into the samples during sample preparation and analysis. The NEPM (NEPC 1999) specifies that laboratory blanks should be conducted at a frequency of "at least one per process batch". The acceptance criterion for laboratory blanks is non-detect at the PQL/LOR.

2.4 Comparability

Comparability is a qualitative parameter designed to express the confidence with which one data set may be compared with another, including established criteria. Comparability is maintained by using consistent methods and ensuring that PQLs/LORs are below the relevant criteria.

2.5 Completeness

Quality control sample completeness is defined as the number of QC samples which should have been analysed, compared to the actual number analysed. If the appropriate number of QC samples are not analysed with each matrix or sample batch, then the data reviewer should use professional judgement to determine if the associated sample data should be qualified.

Completeness also refers to the complete and correct inclusion of field/sample documentation and laboratory documentation.

2.5.1 QC sample frequency and criteria

Based on EPA made or approved guidelines, the following QC samples are required for all contaminated site investigations, unless otherwise specified as part of the data quality objectives (DQOs) process review. All data to be used for validation should conform as a minimum to the requirements specified, regardless of minimum sample size.

Quality control sample	Frequency	Results ¹
<i>Precision</i>		
Field duplicates.	≥ 5%	≤ 30 - 50% ²
Inter-laboratory duplicates.	≥ 5%	≤ 30 - 50% ²
Laboratory duplicates.	≥ 10%	Lab specified ³
<i>Accuracy</i>		
Surrogate spikes.	Organics by GC	70 - 130% ⁴
Matrix spikes (MSs).	≥ 1/media type	70 - 130% ⁵
Laboratory control samples (LCSs).	≥ 1/lab batch	70 - 130% ⁶
Certified reference material (CRM).	LCS for metals	Lab specified ⁷
<i>Representativeness</i>		
Rinsate samples.	≥ 1/field batch	< LOR
Trip blanks.	≥ 1/field batch (volatiles)	< LOR
Trip spikes.	≥ 1/field batch (volatiles)	70 - 130%, ≤ 30 - 50% ⁸
Laboratory blanks.	≥ 1/lab batch	< LOR

Notes:

- Where results are laboratory specified, the laboratory analytical reports should be consulted for specific information.
- Relative percentage differences (RPDs) for field duplicates from AS 4482.1 (1997).
- RPDs for laboratory duplicates specified by the laboratory. Based on the magnitude of the results compared to the level of reporting (LOR), e.g. ALS: result < 10 x LOR = no limit, 10 - 20 x LOR = 0-50%, > 20 x LOR = 0-20%. LabMark: < 5 x LOR = 0-100%, 5 - 10 x LOR = 0-75%, > 10 x LOR = 0-50% or 0-30% for metals.
- Surrogate recoveries specified by laboratory based on global acceptance criteria or dynamic recovery limits based on statistical evaluation of actual laboratory data.
- MS recoveries specified by laboratory based on global acceptance criteria.
- LCS recoveries specified by laboratory based on global acceptance criteria or dynamic recovery limits based on statistical evaluation of actual laboratory data.
- CRM recoveries specified by laboratory based on global acceptance criteria.
- Trip spike results are specified as either recoveries or RPDs.

3.0 References

Australian New Zealand Environment and Conservation Council (1996) *Guidelines for the laboratory analysis of contaminated soils*. ANZECC, Canberra, ACT.

Australian Standard AS 4482.1 (2005) *Guide to the sampling and investigation of potentially contaminated soil, Part 1: Non-volatile and Semi-volatile compounds*. Standards Australia, Homebush, NSW.

National Environment Protection Council (NEPC) (1999) *National Environmental Protection (Assessment of Site Contamination) Measure 1999* (as amended April 2013). National Environment Protection Council, Canberra.

NSW Environment Protection Authority (1994) *Contaminated Sites: Guidelines for Assessing Service Station Sites*. NSW EPA, Chatswood, NSW.

NSW Environment Protection Authority (1997) *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites*. NSW EPA, Chatswood, NSW.

United States Environmental Protection Agency, Contract Laboratory Program (1994) *National Functional Guidelines for Inorganic Data Review*. USEPA, Washington, DC.

United States Environmental Protection Agency, Contract Laboratory Program (1999) *National Functional Guidelines for Organic Data Review*. USEPA, Washington, DC.

Appendix D

Photographic Log



Photograph 1
View west towards the Goulburn Roundhouse from Braidwood Road.



Photograph 2
View southwest towards the Administration Building, located to the east of the Roundhouse Building.



Photograph 3

View west from Braidwood Road towards the former workshop / machine shop and former office building on the eastern side of the fenceline.



Photograph 4

View south on the eastern side of the fence line and east of the former office building.



Photograph 5
View southeast towards Braidwood Road from Test Pitting location TP23.



Photograph 6
View south towards the filled area located to the east of the former workshop / machine shop, from test pitting location TP28.



Photograph 7

View southwest towards the small warehouse located in the southern portion of the site.



Photograph 8

View east towards Braidwood Road from test pitting location TP34.



Photograph 9

View north towards the former workshop / machine shop in the southern portion of the site. Filled area is evident in the foreground.



Photograph 10

View south towards the location of test pit TP44.



Photograph 11
View southwest towards the location of test pit TP45.



Photograph 12
View south towards the Hume Highway rail overpass from test pitting location TP39, in the southern portion of the site.



Photograph 13

Buried waste materials and sandy gravel / ash fill material observed during the advancement of test pit location TP23, within the filled area to the east of the former office building.



Photograph 14

Test pitting location TP23.



Photograph 15

Ash fill material overlying natural sandy clay within test pitting location TP25.



Photograph 16

Clayey sandy gravel / ash fill material overlying natural sandy clay within test pitting location TP34.



Photograph 17

Asbestos fragments observed within fill material from 1.7 metres in depth during the advancement of TP30.



Photograph 18

Ash fill material overlying natural sandy clay material observed during the advancement of TP27.



Photograph 19

During the advancement of test pitting location TP30, within the filled area adjacent to the former maintenance pit in the southern portion of the site.



Photograph 20

Natural sandy clay material observed during advancement of test pitting location TP37.



Photograph 21

Fill material observed during the advancement of groundwater monitoring well MW09, located within the former oil drum compound, at approximately 1.0 metres depth.



Photograph 22

Natural clay material observed during the advancement of groundwater monitoring well MW11, located to the east of the refuelling gantry, at approximately 7.0 metres depth.



Photograph 23

View north during advancement of groundwater monitoring well MW11, to the east and downgradient of the former refuelling gantry.



Photograph 24

View northwest towards monitoring well location MW09, located within the former oil drum compound.



Photograph 25

View west towards monitoring well location MW10, located downgradient of the former refuelling gantry.



Photograph 26

View north towards monitoring well location MW11, located to the east of the former refuelling gantry.



Photograph 27

View west towards monitoring well location MW12, located to the southeast of the former refuelling gantry.



Photograph 28

View west towards monitoring well location MW13, located to the east of the Roundhouse building.

Appendix E

Laboratory Analytical Certificates

CERTIFICATE OF ANALYSIS

Work Order : **ES2121889**
Client : **CAVVANBA CONSULTING**
Contact : MR DREW WOOD
Address : PO Box 322
 NEWCASTLE 2300
Telephone : +61 02 6685 7811
Project : 20025.76
Order number : 20025.76
C-O-C number : ----
Sampler : DREW WOOD, MICHAEL WRIGHT
Site : ----
Quote number : SYBQ/409/20
No. of samples received : 53
No. of samples analysed : 14

Page : 1 of 15
Laboratory : Environmental Division Sydney
Contact : Brenda Hong
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164

Telephone : +61 2 8784 8555
Date Samples Received : 10-Jun-2021 15:32
Date Analysis Commenced : 15-Jun-2021
Issue Date : 18-Jun-2021 18:02



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP068: Where reported, Total OCP is the sum of the reported concentrations of all Organochlorine Pesticides at or above LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EP080: Result for MW09 0.0-0.05 has been confirmed.
- EG035: Positive Hg result ES2121889 #38 has been confirmed by reanalysis.
- EP080: The trip spike and its control have been analysed for volatile TPH and BTEXN only. The trip spike and control were prepared in the lab using reagent grade sand spiked with petrol. The spike was dispatched from the lab and the control retained.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW09 0.0-0.05	MW09 7.9-8.0	MW10 6.9-7.0	MW10 7.9-8.0	MW11 0.05-0.1
Sampling date / time				09-Jun-2021 00:00	09-Jun-2021 00:00	09-Jun-2021 00:00	09-Jun-2021 00:00	08-Jun-2021 00:00	
Compound	CAS Number	LOR	Unit	ES2121889-001	ES2121889-007	ES2121889-016	ES2121889-017	ES2121889-018	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%	16.8	22.1	12.3	15.4	17.2	
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg	40	<5	<5	<5	<5	
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1	
Chromium	7440-47-3	2	mg/kg	15	22	44	44	29	
Copper	7440-50-8	5	mg/kg	93	15	20	21	18	
Lead	7439-92-1	5	mg/kg	144	10	23	27	17	
Nickel	7440-02-0	2	mg/kg	10	11	20	23	8	
Zinc	7440-66-6	5	mg/kg	320	14	6	8	7	
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW09 0.0-0.05	MW09 7.9-8.0	MW10 6.9-7.0	MW10 7.9-8.0	MW11 0.05-0.1
Sampling date / time				09-Jun-2021 00:00	09-Jun-2021 00:00	09-Jun-2021 00:00	09-Jun-2021 00:00	08-Jun-2021 00:00	
Compound	CAS Number	LOR	Unit	ES2121889-001	ES2121889-007	ES2121889-016	ES2121889-017	ES2121889-018	
				Result	Result	Result	Result	Result	
EP068A: Organochlorine Pesticides (OC) - Continued									
4.4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5 0-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	0.6	0.6	0.6	
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	1.2	1.2	1.2	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10	
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50	
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
C29 - C36 Fraction	----	100	mg/kg	110	<100	<100	<100	130	
^ C10 - C36 Fraction (sum)	----	50	mg/kg	110	<50	<50	<50	130	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW09 0.0-0.05	MW09 7.9-8.0	MW10 6.9-7.0	MW10 7.9-8.0	MW11 0.05-0.1
Sampling date / time				09-Jun-2021 00:00	09-Jun-2021 00:00	09-Jun-2021 00:00	09-Jun-2021 00:00	08-Jun-2021 00:00	
Compound	CAS Number	LOR	Unit	ES2121889-001	ES2121889-007	ES2121889-016	ES2121889-017	ES2121889-018	
				Result	Result	Result	Result	Result	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10	
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50	
>C16 - C34 Fraction	----	100	mg/kg	150	<100	<100	<100	160	
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	180	
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	150	<50	<50	<50	340	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50	
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	1.8	<0.5	<0.5	<0.5	<0.5	
ortho-Xylene	95-47-6	0.5	mg/kg	0.7	<0.5	<0.5	<0.5	<0.5	
^ Sum of BTEX	----	0.2	mg/kg	2.5	<0.2	<0.2	<0.2	<0.2	
^ Total Xylenes	----	0.5	mg/kg	2.5	<0.5	<0.5	<0.5	<0.5	
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1	
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%	91.5	101	102	52.7	82.6	
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%	105	114	112	53.1	94.0	
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%	76.4	76.8	76.5	58.9	67.6	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%	87.2	99.0	99.0	91.5	88.5	
2-Chlorophenol-D4	93951-73-6	0.5	%	88.3	98.3	97.6	95.8	92.7	
2,4,6-Tribromophenol	118-79-6	0.5	%	72.4	86.2	87.1	80.4	76.2	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%	97.0	95.8	89.3	95.2	91.7	
Anthracene-d10	1719-06-8	0.5	%	105	99.2	101	110	104	
4-Terphenyl-d14	1718-51-0	0.5	%	94.1	96.3	95.8	91.7	100	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	97.9	78.8	84.3	77.7	91.8	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW09 0.0-0.05	MW09 7.9-8.0	MW10 6.9-7.0	MW10 7.9-8.0	MW11 0.05-0.1
Sampling date / time				09-Jun-2021 00:00	09-Jun-2021 00:00	09-Jun-2021 00:00	09-Jun-2021 00:00	08-Jun-2021 00:00	
Compound	CAS Number	LOR	Unit	ES2121889-001	ES2121889-007	ES2121889-016	ES2121889-017	ES2121889-018	
				Result	Result	Result	Result	Result	
EP080S: TPH(V)/BTEX Surrogates - Continued									
Toluene-D8	2037-26-5	0.2	%	97.1	82.7	87.2	82.1	91.7	
4-Bromofluorobenzene	460-00-4	0.2	%	86.0	82.1	90.5	86.2	95.7	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		Sample ID		MW11 8.9-9.0	MW12 0.0-0.05	MW12 7.9-8.0	MW13 0.0-0.05	MW13 4.9-5.0
		Sampling date / time		08-Jun-2021 00:00				
Compound	CAS Number	LOR	Unit	ES2121889-027	ES2121889-028	ES2121889-036	ES2121889-038	ES2121889-044
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	14.7	15.8	22.2	18.5	17.9
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	9	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	18	23	11	37	24
Copper	7440-50-8	5	mg/kg	10	150	9	1050	15
Lead	7439-92-1	5	mg/kg	12	330	7	1120	18
Nickel	7440-02-0	2	mg/kg	10	8	9	10	14
Zinc	7440-66-6	5	mg/kg	8	341	<5	135	6
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	0.4	<0.1
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW11 8.9-9.0	MW12 0.0-0.05	MW12 7.9-8.0	MW13 0.0-0.05	MW13 4.9-5.0
Sampling date / time				08-Jun-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2121889-027	ES2121889-028	ES2121889-036	ES2121889-038	ES2121889-044	
				Result	Result	Result	Result	Result	
EP068A: Organochlorine Pesticides (OC) - Continued									
4.4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5 0-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	0.6	0.6	0.6	
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	1.2	1.2	1.2	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10	
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50	
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	100	<100	
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	100	<50	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW11 8.9-9.0	MW12 0.0-0.05	MW12 7.9-8.0	MW13 0.0-0.05	MW13 4.9-5.0
Sampling date / time				08-Jun-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2121889-027	ES2121889-028	ES2121889-036	ES2121889-038	ES2121889-044	
				Result	Result	Result	Result	Result	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10	
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50	
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	120	<100	
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	120	<50	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50	
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1	
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%	108	111	131	124	126	
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%	123	99.7	114	112	111	
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%	75.7	68.2	73.1	78.0	72.4	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%	91.2	91.3	97.4	98.0	98.0	
2-Chlorophenol-D4	93951-73-6	0.5	%	88.8	89.7	95.4	95.5	98.5	
2,4,6-Tribromophenol	118-79-6	0.5	%	75.1	73.5	81.7	81.1	81.8	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%	100	101	92.2	97.5	99.6	
Anthracene-d10	1719-06-8	0.5	%	105	105	97.1	112	93.2	
4-Terphenyl-d14	1718-51-0	0.5	%	87.6	92.0	94.4	95.6	95.6	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	77.8	101	84.2	101	86.1	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW11 8.9-9.0	MW12 0.0-0.05	MW12 7.9-8.0	MW13 0.0-0.05	MW13 4.9-5.0
Sampling date / time				08-Jun-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2121889-027	ES2121889-028	ES2121889-036	ES2121889-038	ES2121889-044	ES2121889-044
				Result	Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued									
Toluene-D8	2037-26-5	0.2	%	77.5	99.8	83.8	96.2	82.2	82.2
4-Bromofluorobenzene	460-00-4	0.2	%	84.0	97.5	88.2	92.2	86.4	86.4



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		Sample ID		QS01	Trip Blank	Trip Spike	Trip Spike Control	----
		Sampling date / time		08-Jun-2021 00:00	09-Jun-2021 00:00	09-Jun-2021 00:00	09-Jun-2021 00:00	----
Compound	CAS Number	LOR	Unit	ES2121889-049	ES2121889-051	ES2121889-052	ES2121889-053	-----
				Result	Result	Result	Result	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	17.4	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	6	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	18	----	----	----	----
Copper	7440-50-8	5	mg/kg	263	----	----	----	----
Lead	7439-92-1	5	mg/kg	325	----	----	----	----
Nickel	7440-02-0	2	mg/kg	8	----	----	----	----
Zinc	7440-66-6	5	mg/kg	277	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	----	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	----	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	----	----	----	----
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	----	----	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	----	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	----	----	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	----	----	----	----
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	QS01	Trip Blank	Trip Spike	Trip Spike Control	----
Sampling date / time				08-Jun-2021 00:00	09-Jun-2021 00:00	09-Jun-2021 00:00	09-Jun-2021 00:00	----	----
Compound	CAS Number	LOR	Unit	ES2121889-049	ES2121889-051	ES2121889-052	ES2121889-053	-----	-----
				Result	Result	Result	Result	----	----
EP068A: Organochlorine Pesticides (OC) - Continued									
4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	----	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	----	----	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	----	----	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	----	----	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5 0-2	0.05	mg/kg	<0.05	----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	----	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	----	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	----	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	----	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	----	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg	<10	<10	25	32	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	----	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	----	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	QS01	Trip Blank	Trip Spike	Trip Spike Control	----
Sampling date / time				08-Jun-2021 00:00	09-Jun-2021 00:00	09-Jun-2021 00:00	09-Jun-2021 00:00	----	----
Compound	CAS Number	LOR	Unit	ES2121889-049	ES2121889-051	ES2121889-052	ES2121889-053	-----	-----
				Result	Result	Result	Result	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	35	46	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	18	23	----	----
>C10 - C16 Fraction	----	50	mg/kg	<50	----	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	----	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	----	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	6.2	8.1	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	1.3	1.7	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	6.9	9.0	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	3.0	4.0	----	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	17.4	22.8	----	----
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	9.9	13.0	----	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	----	----
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%	121	----	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%	109	----	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%	77.2	----	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%	99.2	----	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	96.1	----	----	----	----	----
2,4,6-Tribromophenol	118-79-6	0.5	%	79.0	----	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%	98.4	----	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%	103	----	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	95.8	----	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	96.1	103	84.3	92.6	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	QS01	Trip Blank	Trip Spike	Trip Spike Control	----
Sampling date / time				08-Jun-2021 00:00	09-Jun-2021 00:00	09-Jun-2021 00:00	09-Jun-2021 00:00	----	
Compound	CAS Number	LOR	Unit	ES2121889-049	ES2121889-051	ES2121889-052	ES2121889-053	-----	
				Result	Result	Result	Result	----	
EP080S: TPH(V)/BTEX Surrogates - Continued									
Toluene-D8	2037-26-5	0.2	%	92.4	99.6	93.2	99.3	----	
4-Bromofluorobenzene	460-00-4	0.2	%	91.9	99.4	98.5	104	----	



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	39	149
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

QUALITY CONTROL REPORT

Work Order	: ES2121889	Page	: 1 of 9
Client	: CAVVANBA CONSULTING	Laboratory	: Environmental Division Sydney
Contact	: MR DREW WOOD	Contact	: Brenda Hong
Address	: PO Box 322 NEWCASTLE 2300	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 6685 7811	Telephone	: +61 2 8784 8555
Project	: 20025.76	Date Samples Received	: 10-Jun-2021
Order number	: 20025.76	Date Analysis Commenced	: 15-Jun-2021
C-O-C number	: ----	Issue Date	: 18-Jun-2021
Sampler	: DREW WOOD, MICHAEL WRIGHT		
Site	: ----		
Quote number	: SYBQ/409/20		
No. of samples received	: 53		
No. of samples analysed	: 14		



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: SOIL

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093): Total Metals by ICP-AES (QC Lot: 3739443)									
ES2121889-001	MW09 0.0-0.05	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	15	12	19.1	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	10	11	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	40	28	35.1	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	93	104	11.3	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	144	142	1.1	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	320	322	0.5	0% - 20%
ES2121889-027	MW11 8.9-9.0	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	18	15	18.3	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	10	8	15.8	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	10	8	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	12	10	13.9	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	8	10	14.9	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3739447)									
ES2121855-001	Anonymous	EA055: Moisture Content	----	0.1	%	21.2	21.5	1.3	0% - 20%
ES2121889-038	MW13 0.0-0.05	EA055: Moisture Content	----	0.1	%	18.5	19.5	5.2	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3739442)									
ES2121889-001	MW09 0.0-0.05	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES2121889-027	MW11 8.9-9.0	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3735480)									
ES2121808-024	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES2121889-007	MW09 7.9-8.0	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 3735479)									



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP068A: Organochlorine Pesticides (OC) (QC Lot: 3735479) - continued									
ES2121808-024	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit		
ES2121889-007	MW09 7.9-8.0	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)	
EP068A: Organochlorine Pesticides (OC) (QC Lot: 3735479) - continued										
ES2121889-007	MW09 7.9-8.0	EP068: 4.4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3735478)										
ES2121808-024	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			205-82-3							
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		ES2121889-007	MW09 7.9-8.0	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0
EP075(SIM): Acenaphthylene	208-96-8			0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
EP075(SIM): Acenaphthene	83-32-9			0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
EP075(SIM): Fluorene	86-73-7			0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
EP075(SIM): Phenanthrene	85-01-8			0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
EP075(SIM): Anthracene	120-12-7			0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
EP075(SIM): Fluoranthene	206-44-0			0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
EP075(SIM): Pyrene	129-00-0			0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
EP075(SIM): Benz(a)anthracene	56-55-3			0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
EP075(SIM): Chrysene	218-01-9			0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2			0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
	205-82-3									
EP075(SIM): Benzo(k)fluoranthene	207-08-9			0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
EP075(SIM): Benzo(a)pyrene	50-32-8			0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5			0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit			
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit			



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3735478) - continued										
ES2121889-007	MW09 7.9-8.0	EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3735297)										
ES2121812-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit	
ES2121889-018	MW11 0.05-0.1	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit	
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3735477)										
ES2121808-024	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit	
ES2121889-007	MW09 7.9-8.0	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3735297)										
ES2121812-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
ES2121889-018	MW11 0.05-0.1	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3735477)										
ES2121808-024	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit	
ES2121889-007	MW09 7.9-8.0	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit	
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit	
EP080: BTEXN (QC Lot: 3735297)										
ES2121812-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
ES2121889-018	MW11 0.05-0.1	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit	
		EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit			
EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit			



Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3739443)									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	93.6	88.0	113	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	90.0	70.0	130	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	91.8	68.0	132	
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	104	89.0	111	
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	87.7	82.0	119	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	83.2	80.0	120	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	76.3	66.0	133	
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3739442)									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.087 mg/kg	100	70.0	125	
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3735480)									
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	106	62.0	126	
EP068A: Organochlorine Pesticides (OC) (QCLot: 3735479)									
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	84.6	69.0	113	
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	86.0	65.0	117	
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	84.3	67.0	119	
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	86.2	68.0	116	
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	80.8	65.0	117	
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	83.7	67.0	115	
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	85.5	69.0	115	
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	93.6	62.0	118	
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	91.8	63.0	117	
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	87.6	66.0	116	
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	91.6	64.0	116	
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	85.7	66.0	116	
EP068: 4.4'-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	86.4	67.0	115	
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	82.9	67.0	123	
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	85.5	69.0	115	
EP068: 4.4'-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	89.4	69.0	121	
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	99.5	56.0	120	
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	85.2	62.0	124	
EP068: 4.4'-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	92.9	66.0	120	
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	89.0	64.0	122	
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	80.7	54.0	130	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3735478)									



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3735478) - continued									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	91.1	77.0	125	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	94.4	72.0	124	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	96.0	73.0	127	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	92.8	72.0	126	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	92.6	75.0	127	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	94.0	77.0	127	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	93.3	73.0	127	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	94.8	74.0	128	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	95.0	69.0	123	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	94.7	75.0	127	
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	96.7	68.0	116	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	93.5	74.0	126	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	93.8	70.0	126	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	87.0	61.0	121	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	86.3	62.0	118	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	95.3	63.0	121	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3735297)									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	95.8	68.4	128	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3735477)									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	110	75.0	129	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	100	77.0	131	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	93.6	71.0	129	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3735297)									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	95.5	68.4	128	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3735477)									
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	101	77.0	125	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	105	74.0	138	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	79.1	63.0	131	
EP080: BTEXN (QCLot: 3735297)									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	97.3	62.0	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	95.8	67.0	121	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	90.9	65.0	117	
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	91.7	66.0	118	
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	90.4	68.0	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	89.3	63.0	119	



Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Concentration	Spike Recovery(%) MS	Acceptable Limits (%)	
						Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3739443)							
ES2121889-001	MW09 0.0-0.05	EG005T: Arsenic	7440-38-2	50 mg/kg	89.9	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	91.8	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	92.0	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	104	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	93.1	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	93.4	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	103	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3739442)							
ES2121889-001	MW09 0.0-0.05	EG035T: Mercury	7439-97-6	5 mg/kg	102	70.0	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3735480)							
ES2121808-024	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	101	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 3735479)							
ES2121808-024	Anonymous	EP068: gamma-BHC	58-89-9	0.5 mg/kg	99.5	70.0	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	91.4	70.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	96.8	70.0	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	89.7	70.0	130
		EP068: Endrin	72-20-8	2 mg/kg	93.4	70.0	130
		EP068: 4.4'-DDT	50-29-3	2 mg/kg	103	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3735478)							
ES2121808-024	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	97.7	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	96.2	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3735297)							
ES2121812-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	91.3	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3735477)							
ES2121808-024	Anonymous	EP071: C10 - C14 Fraction	----	480 mg/kg	81.3	73.0	137
		EP071: C15 - C28 Fraction	----	3100 mg/kg	102	53.0	131
		EP071: C29 - C36 Fraction	----	2060 mg/kg	108	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3735297)							
ES2121812-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	90.6	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3735477)							
ES2121808-024	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	96.8	73.0	137
		EP071: >C16 - C34 Fraction	----	4320 mg/kg	107	53.0	131



Sub-Matrix: **SOIL**

				<i>Matrix Spike (MS) Report</i>				
				<i>Spike</i>	<i>SpikeRecovery(%)</i>	<i>Acceptable Limits (%)</i>		
<i>Laboratory sample ID</i>	<i>Sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>Concentration</i>	<i>MS</i>	<i>Low</i>	<i>High</i>	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3735477) - continued								
ES2121808-024	Anonymous	EP071: >C34 - C40 Fraction	----	890 mg/kg	93.8	52.0	132	
EP080: BTEXN (QCLot: 3735297)								
ES2121812-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	86.2	70.0	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	86.5	70.0	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	85.0	70.0	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	82.7	70.0	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	85.2	70.0	130	
	EP080: Naphthalene	91-20-3	2.5 mg/kg	77.9	70.0	130		

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2121889	Page	: 1 of 7
Client	: CAVVANBA CONSULTING	Laboratory	: Environmental Division Sydney
Contact	: MR DREW WOOD	Telephone	: +61 2 8784 8555
Project	: 20025.76	Date Samples Received	: 10-Jun-2021
Site	: ----	Issue Date	: 18-Jun-2021
Sampler	: DREW WOOD, MICHAEL WRIGHT	No. of samples received	: 53
Order number	: 20025.76	No. of samples analysed	: 14

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**



Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA055: Moisture Content (Dried @ 105-110°C)								
Soil Glass Jar - Unpreserved (EA055) MW11 0.05-0.1, MW12 0.0-0.05, MW13 0.0-0.05, QS01	MW11 8.9-9.0, MW12 7.9-8.0, MW13 4.9-5.0, QS01	08-Jun-2021	----	----	----	16-Jun-2021	22-Jun-2021	✓
Soil Glass Jar - Unpreserved (EA055) MW09 0.0-0.05, MW10 6.9-7.0,	MW09 7.9-8.0, MW10 7.9-8.0	09-Jun-2021	----	----	----	16-Jun-2021	23-Jun-2021	✓
EG005(ED093)T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T) MW11 0.05-0.1, MW12 0.0-0.05, MW13 0.0-0.05, QS01	MW11 8.9-9.0, MW12 7.9-8.0, MW13 4.9-5.0, QS01	08-Jun-2021	16-Jun-2021	05-Dec-2021	✓	16-Jun-2021	05-Dec-2021	✓
Soil Glass Jar - Unpreserved (EG005T) MW09 0.0-0.05, MW10 6.9-7.0,	MW09 7.9-8.0, MW10 7.9-8.0	09-Jun-2021	16-Jun-2021	06-Dec-2021	✓	16-Jun-2021	06-Dec-2021	✓
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved (EG035T) MW11 0.05-0.1, MW12 0.0-0.05, MW13 0.0-0.05, QS01	MW11 8.9-9.0, MW12 7.9-8.0, MW13 4.9-5.0, QS01	08-Jun-2021	16-Jun-2021	06-Jul-2021	✓	17-Jun-2021	06-Jul-2021	✓
Soil Glass Jar - Unpreserved (EG035T) MW09 0.0-0.05, MW10 6.9-7.0,	MW09 7.9-8.0, MW10 7.9-8.0	09-Jun-2021	16-Jun-2021	07-Jul-2021	✓	17-Jun-2021	07-Jul-2021	✓



Matrix: **SOIL**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EP066: Polychlorinated Biphenyls (PCB)								
Soil Glass Jar - Unpreserved (EP066) MW11 0.05-0.1, MW12 0.0-0.05, MW13 0.0-0.05, QS01	MW11 8.9-9.0, MW12 7.9-8.0, MW13 4.9-5.0,	08-Jun-2021	16-Jun-2021	22-Jun-2021	✓	17-Jun-2021	26-Jul-2021	✓
Soil Glass Jar - Unpreserved (EP066) MW09 0.0-0.05, MW10 6.9-7.0,	MW09 7.9-8.0, MW10 7.9-8.0	09-Jun-2021	16-Jun-2021	23-Jun-2021	✓	17-Jun-2021	26-Jul-2021	✓
EP068A: Organochlorine Pesticides (OC)								
Soil Glass Jar - Unpreserved (EP068) MW11 0.05-0.1, MW12 0.0-0.05, MW13 0.0-0.05, QS01	MW11 8.9-9.0, MW12 7.9-8.0, MW13 4.9-5.0,	08-Jun-2021	16-Jun-2021	22-Jun-2021	✓	17-Jun-2021	26-Jul-2021	✓
Soil Glass Jar - Unpreserved (EP068) MW09 0.0-0.05, MW10 6.9-7.0,	MW09 7.9-8.0, MW10 7.9-8.0	09-Jun-2021	16-Jun-2021	23-Jun-2021	✓	17-Jun-2021	26-Jul-2021	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP075(SIM)) MW11 0.05-0.1, MW12 0.0-0.05, MW13 0.0-0.05, QS01	MW11 8.9-9.0, MW12 7.9-8.0, MW13 4.9-5.0,	08-Jun-2021	16-Jun-2021	22-Jun-2021	✓	16-Jun-2021	26-Jul-2021	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) MW09 0.0-0.05, MW10 6.9-7.0,	MW09 7.9-8.0, MW10 7.9-8.0	09-Jun-2021	16-Jun-2021	23-Jun-2021	✓	16-Jun-2021	26-Jul-2021	✓



Matrix: SOIL

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP080) MW11 0.05-0.1, MW12 0.0-0.05, MW13 0.0-0.05, QS01	MW11 8.9-9.0, MW12 7.9-8.0, MW13 4.9-5.0,	08-Jun-2021	15-Jun-2021	22-Jun-2021	✓	17-Jun-2021	22-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP071) MW11 0.05-0.1, MW12 0.0-0.05, MW13 0.0-0.05, QS01	MW11 8.9-9.0, MW12 7.9-8.0, MW13 4.9-5.0,	08-Jun-2021	16-Jun-2021	22-Jun-2021	✓	16-Jun-2021	26-Jul-2021	✓
Soil Glass Jar - Unpreserved (EP080) MW09 0.0-0.05, MW10 6.9-7.0, Trip Blank, Trip Spike Control	MW09 7.9-8.0, MW10 7.9-8.0, Trip Spike,	09-Jun-2021	15-Jun-2021	23-Jun-2021	✓	17-Jun-2021	23-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP071) MW09 0.0-0.05, MW10 6.9-7.0,	MW09 7.9-8.0, MW10 7.9-8.0	09-Jun-2021	16-Jun-2021	23-Jun-2021	✓	16-Jun-2021	26-Jul-2021	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Soil Glass Jar - Unpreserved (EP080) MW11 0.05-0.1, MW12 0.0-0.05, MW13 0.0-0.05, QS01	MW11 8.9-9.0, MW12 7.9-8.0, MW13 4.9-5.0,	08-Jun-2021	15-Jun-2021	22-Jun-2021	✓	17-Jun-2021	22-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP071) MW11 0.05-0.1, MW12 0.0-0.05, MW13 0.0-0.05, QS01	MW11 8.9-9.0, MW12 7.9-8.0, MW13 4.9-5.0,	08-Jun-2021	16-Jun-2021	22-Jun-2021	✓	16-Jun-2021	26-Jul-2021	✓
Soil Glass Jar - Unpreserved (EP080) MW09 0.0-0.05, MW10 6.9-7.0, Trip Blank, Trip Spike Control	MW09 7.9-8.0, MW10 7.9-8.0, Trip Spike,	09-Jun-2021	15-Jun-2021	23-Jun-2021	✓	17-Jun-2021	23-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP071) MW09 0.0-0.05, MW10 6.9-7.0,	MW09 7.9-8.0, MW10 7.9-8.0	09-Jun-2021	16-Jun-2021	23-Jun-2021	✓	16-Jun-2021	26-Jul-2021	✓



Matrix: **SOIL**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EP080: BTEXN								
Soil Glass Jar - Unpreserved (EP080) MW11 0.05-0.1, MW12 0.0-0.05, MW13 0.0-0.05, QS01	MW11 8.9-9.0, MW12 7.9-8.0, MW13 4.9-5.0,	08-Jun-2021	15-Jun-2021	22-Jun-2021	✓	17-Jun-2021	22-Jun-2021	✓
Soil Glass Jar - Unpreserved (EP080) MW09 0.0-0.05, MW10 6.9-7.0, Trip Blank, Trip Spike Control	MW09 7.9-8.0, MW10 7.9-8.0, Trip Spike,	09-Jun-2021	15-Jun-2021	23-Jun-2021	✓	17-Jun-2021	23-Jun-2021	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: * = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3).
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM Schedule B(3).
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na ₂ SO ₄ and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ES2121889

Client : CAVVANBA CONSULTING
Contact : MR DREW WOOD
Address : PO Box 322 NEWCASTLE 2300
Laboratory : Environmental Division Sydney
Contact : Brenda Hong
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail : drew@cavvanba.com
E-mail : Brenda.Hong@ALSGlobal.com
Telephone : +61 02 6685 7811
Telephone : +61 2 8784 8555
Facsimile : +61 02 6685 5083
Facsimile : +61-2-8784 8500
Project : 20025.76
Page : 1 of 3
Order number : 20025.76
Quote number : EB2017CAVCON0001 (SYBQ/409/20)
C-O-C number : ----
QC Level : NEPM 2013 B3 & ALS QC Standard
Site : ----
Sampler : DREW WOOD, MICHAEL WRIGHT

Dates

Date Samples Received : 10-Jun-2021 15:32
Issue Date : 11-Jun-2021
Client Requested Due : 18-Jun-2021
Scheduled Reporting Date : 18-Jun-2021
Date

Delivery Details

Mode of Delivery : Undefined
Security Seal : Not Available
No. of coolers/boxes : ----
Temperature : 0.8 - Ice present
Receipt Detail :
No. of samples received / analysed : 51 / 14
No. of samples NOT collected : 2

General Comments

- This report contains the following information:
- Sample Container(s)/Preservation Non-Compliances
- Summary of Sample(s) and Requested Analysis
- Proactive Holding Time Report
- Requested Deliverables
Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.
Sample MW10 4.9-5.0 was not received due to the following reason: sample not received
Sample MW13 8.9-9.0 was not received due to the following reason: Sample not received
Please direct any queries you have regarding this work order to the above ALS laboratory contact.
Analytical work for this work order will be conducted at ALS Sydney.
Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



Sample Container(s)/Preservation Non-Compliances

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

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - S-08 TRH/BTEXN/PAH/OC/PCB/8 Metals	SOIL - S-18 (NO MOIST) TRH(C6-C9)/BTEXN with No Moisture for TBs
ES2121889-001	09-Jun-2021 00:00	MW09 0.0-0.05		✓	✓	
ES2121889-002	09-Jun-2021 00:00	MW09 0.9-1.0	✓			
ES2121889-003	09-Jun-2021 00:00	MW09 1.9-2.0	✓			
ES2121889-004	09-Jun-2021 00:00	MW09 2.9-3.0	✓			
ES2121889-005	09-Jun-2021 00:00	MW09 3.9-4.0	✓			
ES2121889-006	09-Jun-2021 00:00	MW09 4.9-5.0	✓			
ES2121889-007	09-Jun-2021 00:00	MW09 7.9-8.0		✓	✓	
ES2121889-008	09-Jun-2021 00:00	MW09 8.9-9.0	✓			
ES2121889-009	09-Jun-2021 00:00	MW10 0.0-0.05	✓			
ES2121889-010	09-Jun-2021 00:00	MW10 0.9-1.0	✓			
ES2121889-011	09-Jun-2021 00:00	MW10 1.9-2.0	✓			
ES2121889-012	09-Jun-2021 00:00	MW10 2.9-3.0	✓			
ES2121889-013	09-Jun-2021 00:00	MW10 3.9-4.0	✓			
ES2121889-015	09-Jun-2021 00:00	MW10 5.9-6.0	✓			
ES2121889-016	09-Jun-2021 00:00	MW10 6.9-7.0		✓	✓	
ES2121889-017	09-Jun-2021 00:00	MW10 7.9-8.0		✓	✓	
ES2121889-018	08-Jun-2021 00:00	MW11 0.05-0.1		✓	✓	
ES2121889-019	08-Jun-2021 00:00	MW11 0.9-1.0	✓			
ES2121889-020	08-Jun-2021 00:00	MW11 1.9-2.0	✓			
ES2121889-021	08-Jun-2021 00:00	MW11 2.9-3.0	✓			
ES2121889-022	08-Jun-2021 00:00	MW11 3.9-4.0	✓			
ES2121889-023	08-Jun-2021 00:00	MW11 4.9-5.0	✓			
ES2121889-024	08-Jun-2021 00:00	MW11 5.9-6.0	✓			
ES2121889-025	08-Jun-2021 00:00	MW11 6.9-7.0	✓			
ES2121889-026	08-Jun-2021 00:00	MW11 7.9-8.0	✓			
ES2121889-027	08-Jun-2021 00:00	MW11 8.9-9.0		✓	✓	
ES2121889-028	08-Jun-2021 00:00	MW12 0.0-0.05		✓	✓	
ES2121889-029	08-Jun-2021 00:00	MW12 0.9-1.0	✓			
ES2121889-030	08-Jun-2021 00:00	MW12 1.9-2.0	✓			
ES2121889-031	08-Jun-2021 00:00	MW12 2.9-3.0	✓			
ES2121889-032	08-Jun-2021 00:00	MW12 3.9-4.0	✓			
ES2121889-033	08-Jun-2021 00:00	MW12 4.9-5.0	✓			
ES2121889-034	08-Jun-2021 00:00	MW12 5.9-6.0	✓			
ES2121889-035	08-Jun-2021 00:00	MW12 6.9-7.0	✓			
ES2121889-036	08-Jun-2021 00:00	MW12 7.9-8.0		✓	✓	



			(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - S-08 TRH/BTEXN/PAH/OC/PCB8 Metals	SOIL - S-18 (NO MOIST) TRH(C6-C9)/BTEXN with No Moisture for TBs
ES2121889-037	08-Jun-2021 00:00	MW12 8.9-9.0	✓			
ES2121889-038	08-Jun-2021 00:00	MW13 0.0-0.05		✓	✓	
ES2121889-039	08-Jun-2021 00:00	MW13 0.4-0.5	✓			
ES2121889-040	08-Jun-2021 00:00	MW13 0.9-1.0	✓			
ES2121889-041	08-Jun-2021 00:00	MW13 1.9-2.0	✓			
ES2121889-042	08-Jun-2021 00:00	MW13 2.9-3.0	✓			
ES2121889-043	08-Jun-2021 00:00	MW13 3.9-4.0	✓			
ES2121889-044	08-Jun-2021 00:00	MW13 4.9-5.0		✓	✓	
ES2121889-045	08-Jun-2021 00:00	MW13 5.9-6.0	✓			
ES2121889-046	08-Jun-2021 00:00	MW13 6.9-7.0	✓			
ES2121889-047	08-Jun-2021 00:00	MW13 7.9-8.0	✓			
ES2121889-049	08-Jun-2021 00:00	QS01		✓	✓	
ES2121889-050	08-Jun-2021 00:00	QS03	✓			
ES2121889-051	09-Jun-2021 00:00	Trip Blank				✓
ES2121889-052	09-Jun-2021 00:00	Trip Spike				✓
ES2121889-053	09-Jun-2021 00:00	Trip Spike Control				✓

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)

Email inbox@cavvanba.com

DREW WOOD

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- Chain of Custody (CoC) (COC)
- EDI Format - ENMRG (ENMRG)
- EDI Format - ESDAT (ESDAT)

Email drew@cavvanba.com
Email drew@cavvanba.com
Email drew@cavvanba.com
Email drew@cavvanba.com
Email drew@cavvanba.com
Email drew@cavvanba.com
Email drew@cavvanba.com

MICHAEL WRIGHT

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- Chain of Custody (CoC) (COC)
- EDI Format - ENMRG (ENMRG)
- EDI Format - ESDAT (ESDAT)

Email michael@cavvanba.com
Email michael@cavvanba.com
Email michael@cavvanba.com
Email michael@cavvanba.com
Email michael@cavvanba.com
Email michael@cavvanba.com
Email michael@cavvanba.com

ROB MCLELLAND

- A4 - AU Tax Invoice (INV)

Email rob@cavvanba.com

18/6/21



CHAIN OF CUSTODY
ALS Laboratory
please tick →

BRISBANE 32 Shand Street Surford QLD 4059 Ph: 07 3243 7222 E: sam@brisbane.alsglobal.com

DADELSIDE 21 Sunra Road Poolara SA 5006 Ph: 08 9359 0480 E: adelaide@alsglobal.com

GLADSTONE 40 Callejondah Drive Clinton QLD 4680 Ph: 07 747 5600 E: gladstone@alsglobal.com

MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 9177 E: mackay@alsglobal.com

MELBOURNE 2-4 Wertheim Road Carlingville VIC 3171 Ph: 03 9448 9600 E: melbourne@alsglobal.com

SYDNEY 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6796 E: mudgee@alsglobal.com

NEWCASTLE 5,685 Midland Rd Newcastle NSW 2294 Ph: 02 4014 2800 E: samples.newcastle@alsglobal.com

GLADSTONE 4713 Geary Place North Nowra NSW 2541 Ph: 0244 23 2053 E: gladstone@alsglobal.com

PERTH 10 Red Way Malaga WA 6060 Ph: 08 9209 7686 E: samples.perth@alsglobal.com

SYDNEY 277 289 Waudslock Road Sutherland NSW 2258 Ph: 02 9734 9536 E: sydney@alsglobal.com

TOWNSVILLE 14-15 Desma Court Dade QLD 4813 Ph: 07 4799 0900 E: townsville@alsglobal.com

WINDYBUSH 30 Kenny Street Windybush NSW 2350 Ph: 02 4075 3125 E: windybush@alsglobal.com

CLIENT: Cavvanba Consulting	TURNAROUND REQUIREMENTS : <input checked="" type="checkbox"/> Standard TAT (List due date): (Standard TAT may be longer for some tests e.g. Ultra Trace Organics) <input type="checkbox"/> Non Standard or urgent TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Newcastle	ALS QUOTE NO.: SYBQ/409/20	Custody Seal Intact? Yes No Free / Frozen Ice blocks present upon receipt? Yes No Random Sample Temperature on Receipt: °C Other Comment: -08
PROJECT: 20025.76	ORDER NUMBER: 20025.76	
PROJECT MANAGER: Drew Wood	CONTACT PH: 0403 689 755	
SAMPLER: Michael Wright / Drew Wood	SAMPLER MOBILE: 0434 376 146	
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	
Email Reports to (will default to PM if no other addresses are listed): drew@cavvanba.com, michael@cavvanba.com	RELINQUISHED BY: M. Wright	RECEIVED BY: [Signature]
Email Invoice to (will default to PM if no other addresses are listed): rob@cavvanba.com	DATE/TIME: 10/6/21 15:30	DATE/TIME: 10/6/21 15:32
		RECEIVED BY: [Signature]
		DATE/TIME: 10/6/21 17:00

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS		CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)				Additional Information
	MATRIX	MATRIX: SOLID (S) WATER (W)	TYPE & PRESERVATIVE	(refer to codes below)	Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).				
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE	TOTAL CONTAINERS	S-TRIB/TEX/PAHs/Metal S 8	TRIB/TEXN	Subcon / Forward Lab / Split WO	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	MW09 0.0-0.05	9/6/21	Sol	1 x Jar	1	/		Lab / Analysis: OSO2 + OSO4 → Euxofins	
2	0.9-1.0							Organised By / Date:	
3	1.9-2.0							Relinquished By / Date:	
4	2.9-3.0							Connote / Courier:	
5	3.9-4.0							WO No:	
6	4.9-5.0							Attached By PC / Internal Sheet:	
7	7.9-8.0								
8	8.9-9.0								
9	MW10 0.0-0.05								
10	0.9-1.0								
11	1.9-2.0								
12	2.9-3.0								
13	3.9-4.0								
14	4.9-5.0								
TOTAL									

Environmental Division
Sydney
Work Order Reference
ES2121889



Telephone : +61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
 V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formic acid Preserved Glass
 Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.



CHAIN OF CUSTODY

ALS Laboratory:
please tick →

DORISDALE 22 Shand Street Stafford QLD 4054
Ph: 07 5543 7222 E: samples.custody@alsglobal.com

GLADELAIDE 21 Nurra Road Poonakee QLD 4690
Ph: 07 5355 0900 E: adelaide@alsglobal.com

MELBOURNE 24 Westgate Road Springvale VIC 3171
Ph: 03 8549 5800 E: samples.melbourne@alsglobal.com

NEWCASTLE 2788 Midland Rd Mayfield West NSW 2304
Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com

SYDNEY 271 GSE Waverley Road Sutherland NSW 2154
Ph: 02 9734 2630 E: sydney@alsglobal.com

GLADSTONE 48 Callenden Drive Clincks QLD 4680
Ph: 07 7477 5602 E: gladstone@alsglobal.com

MACKAY 74 Harbour Road Mackay QLD 4740
Ph: 07 4944 0777 E: mackay@alsglobal.com

BRISBANE 27 Sydney Road Mtogrie NSW 2850
Ph: 02 8712 8735 E: mudgee@alsglobal.com

KNOWRA 419 Gagey F Road North Nowra NSW 2541
Ph: 024423 2300 E: nowra@alsglobal.com

PERTH 10 Mac Way Mossgoona WA 6050
Ph: 08 9209 7000 E: samples.perth@alsglobal.com

WINDYBUSH 99 Kenny Street Wollongong NSW 2530
Ph: 02 4225 5135 E: winds@alsglobal.com

CLIENT: Cavvanba Consulting
OFFICE: Newcastle
PROJECT: 20025.76
ORDER NUMBER: 20025.76

TURNAROUND REQUIREMENTS: Standard TAT (List due date):
(Standard TAT may be longer for some tests e.g. Ultra Trace Organics) Non Standard or urgent TAT (List due date):
ALS QUOTE NO.: SYBQ/409/20

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No N/A
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: °C
Other comment: 70.8

PROJECT MANAGER: Drew Wood CONTACT PH: 0403 689 755

SAMPLER: Michael Wright / Drew Wood SAMPLER MOBILE: 0434 376 146

COC emailed to ALS? (YES / NO) EDD FORMAT (or default):

Email Reports to (will default to PM if no other addresses are listed): drew@cavvanba.com, michael@cavvanba.com

Email Invoice to (will default to PM if no other addresses are listed): rob@cavvanba.com

RELINQUISHED BY: M. Wright
DATE/TIME: 10/6/21 15:30

RECEIVED BY: [Signature]
DATE/TIME: 10/6/21 15:32

RELINQUISHED BY: [Signature]
DATE/TIME: 10/6/21 17:00

RECEIVED BY: [Signature]
DATE/TIME: 10/6/21 19:30

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)							Additional Information	
	MATRIX: SOLID (S) WATER (W)	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below	(refer to TOTAL CONTAINERS)	Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below	(refer to TOTAL CONTAINERS)	S. TRH/BTEX/PAHs/Metal 5.8	TRH/BTEXN							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
15	MW10 5.9-6.0	9/6/21	Soil	1 x Jar	1									
16	↓ 6.9-7.0	↓												
17	↓ 7.9-8.0	↓												
18	MW11 0.05-0.1	8/6/21												
19	↓ 0.9-1.0													
20	↓ 1.9-2.0													
21	↓ 2.9-3.0													
22	↓ 3.9-4.0													
23	↓ 4.9-5.0													
24	↓ 5.9-6.0													
25	↓ 6.9-7.0													
26	↓ 7.9-8.0													
27	↓ 8.9-9.0													
28	MW12 0.0-0.05													
					TOTAL									

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
 V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass
 Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag



CHAIN OF CUSTODY

ALS Laboratory:
please tick →

15th Street, 1st Floor, Sydney NSW 1511
Ph: 02 9439 7100 E: samuel.brook@alsglobal.com

15th Street, 1st Floor, Sydney NSW 1511
Ph: 02 9439 7100 E: adelaide@alsglobal.com

15th Street, 1st Floor, Sydney NSW 1511
Ph: 02 9439 7100 E: victoria@alsglobal.com

15th Street, 1st Floor, Sydney NSW 1511
Ph: 02 9439 7100 E: waikato@alsglobal.com

15th Street, 1st Floor, Sydney NSW 1511
Ph: 02 9439 7100 E: west@alsglobal.com

15th Street, 1st Floor, Sydney NSW 1511
Ph: 02 9439 7100 E: wilmington@alsglobal.com

15th Street, 1st Floor, Sydney NSW 1511
Ph: 02 9439 7100 E: wilmington@alsglobal.com

15th Street, 1st Floor, Sydney NSW 1511
Ph: 02 9439 7100 E: wilmington@alsglobal.com

15th Street, 1st Floor, Sydney NSW 1511
Ph: 02 9439 7100 E: wilmington@alsglobal.com

15th Street, 1st Floor, Sydney NSW 1511
Ph: 02 9439 7100 E: wilmington@alsglobal.com

CLIENT: Cavvanba Consulting

OFFICE: Newcastle

PROJECT: 20025.76

ORDER NUMBER: 20025.76

PROJECT MANAGER: Drew Wood

SAMPLER: Michael Wright / Drew Wood

COC emailed to ALS? (YES / NO)

Email Reports to (will default to PM if no other addresses are listed): drew@cavvanba.com, michael@cavvanba.com

Email Invoice to (will default to PM if no other addresses are listed): rob@cavvanba.com

TURNAROUND REQUIREMENTS :

(Standard TAT may be longer for some tests e.g. trace Organics)

Standard TAT (List due date):

Non Standard or Urgent TAT (List due date):

ALS QUOTE NO.: SYBQ/409/20

COC SEQUENCE NUMBER (Circle)

COC: 1 2 3 4 5 6 7

OF: 1 2 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)

Unsuitable Impact

Yes No N/A

Free Ices / Frozen Ice Bricks present upon receipt

Yes No N/A

Refrigeration Sample Temperature on Receipt

Yes No N/A

Other comment:

RELINQUISHED BY:

M. Wright

DATE/TIME: 10/6/21 15:30

RECEIVED BY:

[Signature]

DATE/TIME: 10/6/21 15:32

RELINQUISHED BY:

[Signature]

DATE/TIME: 10/6/21 17:00

RECEIVED BY:

[Signature]

DATE/TIME: 10/6/21 19:30

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)					Additional Information	
	MATRIX	SOLID (S)/WATER (W)	DATE / TIME	TYPE & PRESERVATIVE codes below	TOTAL CONTAINERS	Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).						
LAB ID	SAMPLE ID	MATRIX	DATE / TIME	TYPE & PRESERVATIVE codes below	TOTAL CONTAINERS	S-TRIBTEX/PAHs/Metal S B	TRIBTEX					Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
29	MW12 0.9-1.0	Soil	8/6/21	1 x Jar	1							
30	1.9-2.0											
31	2.9-3.0											
32	3.9-4.0											
33	4.9-5.0											
34	5.9-6.0											
35	6.9-7.0											
36	7.9-8.0											
37	8.9-9.0											
38	MW13 0.0-0.05											
39	0.4-0.5											
40	0.9-1.0											
41	1.9-2.0											
42	2.9-3.0											
					TOTAL							

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
 V = VOA Vial HCl Preserved; VS = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
 Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.



CHAIN OF CUSTODY

ALS Laboratory:
please tick →

ALS QLD 1/200 Sharn Street Stretton QLD 4129
Ph: 07 3247 1100 E: sales@alsqld.com.au

ALS VIC 2/217 Burke Road Ringwood VIC 3135
Ph: 03 9497 9000 E: sales@alsvic.com.au

ALS NSW 1/150 The Quadrant Sydney NSW 1501
Ph: 02 9370 9000 E: sales@alsnsw.com.au

ALS WA 1/100 Stirling Highway Perth WA 6000
Ph: 08 9442 1000 E: sales@alswa.com.au

ALS TAS 1/100 Stirling Highway Hobart TAS 7000
Ph: 03 6233 1000 E: sales@alstas.com.au

ALS ACT 1/100 Stirling Highway Canberra ACT 2600
Ph: 02 6233 1000 E: sales@alsact.com.au

ALS SA 1/100 Stirling Highway Adelaide SA 5000
Ph: 08 8233 1000 E: sales@als.sa.gov.au

ALS NT 1/100 Stirling Highway Darwin NT 1308
Ph: 08 8233 1000 E: sales@alsnt.com.au

ALS QLD 2/200 Sharn Street Stretton QLD 4129
Ph: 07 3247 1100 E: sales@alsqld.com.au

ALS VIC 2/217 Burke Road Ringwood VIC 3135
Ph: 03 9497 9000 E: sales@alsvic.com.au

CLIENT: Cavvanba Consulting
OFFICE: Newcastle

PROJECT: 20025.76
ORDER NUMBER: 20025.76
PROJECT MANAGER: Drew Wood

SAMPLER: Michael Wright / Drew Wood
CONTACT PH: 0403 689 755

COC emailed to ALS? (YES / NO)
Email Reports to (will default to PM if no other addresses are listed): drew@cavvanba.com, michael@cavvanba.com
Email Invoice to (will default to PM if no other addresses are listed): rob@cavvanba.com

TURNAROUND REQUIREMENTS :
 Standard TAT (List due date):
 Non Standard or urgent (TAT) (List due date):

ALS QUOTE NO.: SYBQ/409/20

FOR LABORATORY USE ONLY (Circle):
 Cavity Seal Intact? Yes No N/A
 (Leakage) Frozen Ice Bricks present upon Receipt? Yes No N/A
 Reconfirm Sample Temperature on Receipt: C
 Other comment: -0.8

COC SEQUENCE NUMBER (Circle)
 COC: 1 2 3 4 5 6 7
 OF: 1 2 3 4 5 6 7

RELINQUISHED BY: M. Wright
DATE/TIME: 16/6/21 15:30

RECEIVED BY: [Signature]
DATE/TIME: 10/6/21 15:52

RELINQUISHED BY: [Signature]
DATE/TIME: 10/6/21 17:00

RECEIVED BY: [Signature]
DATE/TIME: 10/6/21 19:30

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S)/WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).					Additional Information	
	LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below (refer to)	TOTAL CONTAINERS	S-TRIBTEX/PAHs/MS	TRIBTEXN				
	43	MW13 3.4-4.0	9.6.21	Soil	1 x Jar	1						
	44	4.9-5.0	↓	↓	↓	↓	↓	↓	↓	↓	↓	
	45	5.9-6.0										
	46	6.9-7.0										
	47	7.9-8.0										
	48	8.9-9.0										
	49	Qs01										
	-	Qs02										
	50	Qs03										
	-	Qs04										
	51,52	Tap blank / Tap site										
	53	ISL										
TOTAL												

please send Qs02 & Qs04 to Eurofins

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CERTIFICATE OF ANALYSIS

Work Order : **ES2125433**
Client : **CAVVANBA CONSULTING**
Contact : MR DREW WOOD
Address : PO Box 322
 NEWCASTLE 2300
Telephone : +61 02 6685 7811
Project : 20025.76
Order number : 20025.76
C-O-C number : ----
Sampler : , DREW WOOD, MICHAEL WRIGHT
Site : ----
Quote number : SY/159/20
No. of samples received : 51
No. of samples analysed : 27

Page : 1 of 8
Laboratory : Environmental Division Sydney
Contact : Brenda Hong
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164

Telephone : +61 2 8784 8555
Date Samples Received : 09-Jul-2021 13:37
Date Analysis Commenced : 15-Jul-2021
Issue Date : 19-Jul-2021 15:57



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP16 0.0-0.05	TP16 0.3-0.4	TP17 0.0-0.05	TP18 0.0-0.05	TP18 0.9-1.0
Sampling date / time				06-Jul-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2125433-001	ES2125433-002	ES2125433-004	ES2125433-007	ES2125433-009	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	19.8	15.4	24.5	18.0	21.0	
EG005(ED093)T: Total Metals by ICP-AES									
Lead	7439-92-1	5	mg/kg	104	396	186	168	38	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP19 0.0-0.05	TP19 0.4-0.5	TP20 0.0-0.05	TP21 0.0-0.05	TP21 0.9-1.0
Sampling date / time				06-Jul-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2125433-010	ES2125433-011	ES2125433-013	ES2125433-016	ES2125433-018	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	28.2	21.7	20.1	17.8	21.4	
EG005(ED093)T: Total Metals by ICP-AES									
Lead	7439-92-1	5	mg/kg	236	443	329	131	89	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP22 0.0-0.05	TP23 0.0-0.05	TP23 0.9-1.0	TP24 0.0-0.05	TP25 0.0-0.05
Sampling date / time				06-Jul-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2125433-020	ES2125433-023	ES2125433-024	ES2125433-027	ES2125433-030	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	21.1	12.1	18.2	11.8	23.1	
EG005(ED093)T: Total Metals by ICP-AES									
Lead	7439-92-1	5	mg/kg	426	226	1540	62	700	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP25 0.4-0.5	TP26 0.0-0.05	TP27 0.0-0.05	TP27 0.4-0.5	TP28 0.0-0.05
Sampling date / time				06-Jul-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2125433-031	ES2125433-033	ES2125433-036	ES2125433-037	ES2125433-039	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	20.0	20.1	14.0	16.5	31.6	
EG005(ED093)T: Total Metals by ICP-AES									
Lead	7439-92-1	5	mg/kg	16	468	275	1040	194	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP28 0.9-1.0	TP29 0.0-0.05	TP29 0.4-0.5	TP30 0.0-0.05	TP30 1.4-1.5
Sampling date / time				06-Jul-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2125433-040	ES2125433-042	ES2125433-043	ES2125433-045	ES2125433-047	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	17.9	20.9	17.0	16.8	19.5	
EG005(ED093)T: Total Metals by ICP-AES									
Lead	7439-92-1	5	mg/kg	61	269	25	32	85	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP31 0.0-0.05	TP32 0.0-0.05	----	----	----
Sampling date / time				06-Jul-2021 00:00	06-Jul-2021 00:00	----	----	----	
Compound	CAS Number	LOR	Unit	ES2125433-048	ES2125433-051	-----	-----	-----	
				Result	Result	----	----	----	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	15.1	18.4	----	----	----	
EG005(ED093)T: Total Metals by ICP-AES									
Lead	7439-92-1	5	mg/kg	882	152	----	----	----	

QUALITY CONTROL REPORT

Work Order	: ES2125433	Page	: 1 of 3
Client	: CAVVANBA CONSULTING	Laboratory	: Environmental Division Sydney
Contact	: MR DREW WOOD	Contact	: Brenda Hong
Address	: PO Box 322 NEWCASTLE 2300	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 6685 7811	Telephone	: +61 2 8784 8555
Project	: 20025.76	Date Samples Received	: 09-Jul-2021
Order number	: 20025.76	Date Analysis Commenced	: 15-Jul-2021
C-O-C number	: ----	Issue Date	: 19-Jul-2021
Sampler	: , DREW WOOD, MICHAEL WRIGHT		
Site	: ----		
Quote number	: SY/159/20		
No. of samples received	: 51		
No. of samples analysed	: 27		



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3793029)									
ES2125433-001	TP16 0.0-0.05	EG005T: Lead	7439-92-1	5	mg/kg	104	108	3.7	0% - 20%
ES2125433-020	TP22 0.0-0.05	EG005T: Lead	7439-92-1	5	mg/kg	426	351	19.3	0% - 20%
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3793031)									
ES2125592-067	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	34	34	0.0	No Limit
ES2125592-091	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	15	20	30.0	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3793037)									
ES2125433-004	TP17 0.0-0.05	EA055: Moisture Content	----	0.1	%	24.5	25.1	2.2	0% - 20%
ES2125433-027	TP24 0.0-0.05	EA055: Moisture Content	----	0.1	%	11.8	11.8	0.0	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3793038)									
ES2125433-043	TP29 0.4-0.5	EA055: Moisture Content	----	0.1	%	17.0	17.6	4.0	0% - 20%



Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
					Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)
Method: Compound	CAS Number	LOR	Unit					LCS	Low
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3793029)									
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	94.1	82.0	119	
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3793031)									
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	114	82.0	119	

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery (%) MS	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number			Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3793029)							
ES2125433-001	TP16 0.0-0.05	EG005T: Lead	7439-92-1	250 mg/kg	97.3	70.0	130
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3793031)							
ES2125592-067	Anonymous	EG005T: Lead	7439-92-1	250 mg/kg	98.2	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2125433	Page	: 1 of 4
Client	: CAVVANBA CONSULTING	Laboratory	: Environmental Division Sydney
Contact	: MR DREW WOOD	Telephone	: +61 2 8784 8555
Project	: 20025.76	Date Samples Received	: 09-Jul-2021
Site	: ----	Issue Date	: 19-Jul-2021
Sampler	: , DREW WOOD, MICHAEL WRIGHT	No. of samples received	: 51
Order number	: 20025.76	No. of samples analysed	: 27

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**



Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis				
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation		
EA055: Moisture Content (Dried @ 105-110°C)									
Soil Glass Jar - Unpreserved (EA055)	06-Jul-2021	TP16 0.0-0.05,	TP16 0.3-0.4,	----	----	----	15-Jul-2021	20-Jul-2021	✓
TP17 0.0-0.05,		TP18 0.0-0.05,							
TP18 0.9-1.0,		TP19 0.0-0.05,							
TP19 0.4-0.5,		TP20 0.0-0.05,							
TP21 0.0-0.05,		TP21 0.9-1.0,							
TP22 0.0-0.05,		TP23 0.0-0.05,							
TP23 0.9-1.0,		TP24 0.0-0.05,							
TP25 0.0-0.05,		TP25 0.4-0.5,							
TP26 0.0-0.05,		TP27 0.0-0.05,							
TP27 0.4-0.5,		TP28 0.0-0.05,							
TP28 0.9-1.0,		TP29 0.0-0.05,							
TP29 0.4-0.5,		TP30 0.0-0.05,							
TP30 1.4-1.5,		TP31 0.0-0.05,							
TP32 0.0-0.05									
EG005(ED093)T: Total Metals by ICP-AES									
Soil Glass Jar - Unpreserved (EG005T)	06-Jul-2021	TP16 0.0-0.05,	TP16 0.3-0.4,	15-Jul-2021	02-Jan-2022	✓	16-Jul-2021	02-Jan-2022	✓
TP17 0.0-0.05,		TP18 0.0-0.05,							
TP18 0.9-1.0,		TP19 0.0-0.05,							
TP19 0.4-0.5,		TP20 0.0-0.05,							
TP21 0.0-0.05,		TP21 0.9-1.0,							
TP22 0.0-0.05,		TP23 0.0-0.05,							
TP23 0.9-1.0,		TP24 0.0-0.05,							
TP25 0.0-0.05,		TP25 0.4-0.5,							
TP26 0.0-0.05,		TP27 0.0-0.05,							
TP27 0.4-0.5,		TP28 0.0-0.05,							
TP28 0.9-1.0,		TP29 0.0-0.05,							
TP29 0.4-0.5,		TP30 0.0-0.05,							
TP30 1.4-1.5,		TP31 0.0-0.05,							
TP32 0.0-0.05									



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Moisture Content	EA055	3	27	11.11	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	4	40	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Total Metals by ICP-AES	EG005T	2	40	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Total Metals by ICP-AES	EG005T	2	40	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Total Metals by ICP-AES	EG005T	2	40	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

<i>Analytical Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).



CHAIN OF CUSTODY

ALS Laboratory
please tick →

CLIENT: Cavvanba Consulting	TURNAROUND REQUIREMENTS : * Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)	
OFFICE: Newcastle	(Standard TAT may be longer for some tests e.g. Ultra Trace Organics) <input type="checkbox"/> Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No <input checked="" type="checkbox"/> N/A	Freezer Frozen Ice bricks present upon receipt? Yes No <input checked="" type="checkbox"/> N/A
PROJECT: 20025.76	ALS QUOTE NO.: SY/159/20	COC SEQUENCE NUMBER (Circle) COC: 0 2 3 4 5 6 7	Random Sample Temperature on Receipt: -2.0 °C
ORDER NUMBER: 20025.76	CONTACT PH: 0403 689 755	OF: 1 2 3 4 5 6 <input checked="" type="checkbox"/>	Other comment: <i>12/17/21 Ha</i>
PROJECT MANAGER: Drew Wood	SAMPLER MOBILE: 0434 376 146	RECEIVED BY: <i>AL</i>	RECEIVED BY: <i>FAM</i>
SAMPLER: Michael Wright / Drew Wood	EDD FORMAT (or default):	DATE/TIME: <i>9/17/21 1:37pm</i>	DATE/TIME: <i>12/17/21 Ha</i>
COC emailed to ALS? (YES / NO)	RELINQUISHED BY: <i>M.Wright</i>		
Email Reports to (will default to PM if no other addresses are listed): draw@cavvanba.com, michael@cavvanba.com	DATE/TIME: <i>9/17/21 13:36</i>		
Email Invoice to (will default to PM if no other addresses are listed): rob@cavvanba.com			

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS		CONTAINER INFORMATION			ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (leached filtered bottle required)				Additional Information
	MATRIX: SOLID (S) WATER (W)					W - TRIBUTEN/PAH/NOCS (W-10)	W - Metals (B)	S - Lead only	TRIBUTEN	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS					Comments on likely contaminant levels, dilutions, or samples requiring specific GC analysis etc.
1	TP16 0.0-0.05	6-7-21	Soil	1 x Jar	1			/		
2	↓ 0.3-0.4							/		
3	↓ 0.9-1.0							/		
4	TP17 0.0-0.05							/		
5	↓ 0.4-0.5							/		
6	↓ 0.9-1.0							/		
7	TP18 0.0-0.05							/		
8	↓ 0.4-0.5							/		
9	↓ 0.9-1.0							/		
10	TP19 0.0-0.05							/		
11	↓ 0.4-0.5							/		
12	↓ 1.4-1.5							/		
13	TP20 0.0-0.05							/		
14	↓ 0.4-0.5							/		
15	↓ 0.9-1.0							/		
16	TP21 0.0-0.05							/		
17	↓ 0.4-0.5							/		
					TOTAL					

Environmental Division
Sydney
Work Order Reference
ES2125433



Telephone : - 61-2-8784 8556

Water Container Codes: P = Unpreserved Plastic, N = Nitric Preserved Plastic, ORC = Nitric Preserved ORC, SH = Sodium Hydroxide/Cd Preserved, S = Sodium Hydroxide Preserved Plastic, AG = Amber Glass Unpreserved, AP = Air-tight Unpreserved Plastic
V = VOA Vial HCl Preserved, VB = VOA Vial Sodium Bisulfate Preserved, VS = VOA Vial Sulfuric Preserved, AV = Air-tight Unpreserved Vial SG = Sulfuric Preserved Amber Glass, H = HCl preserved Plastic, HS = HCl preserved Speciation bottle, SP = Sulfuric Preserved Plastic, F = Formaldehyde Preserved Glass
E = Zinc Acetate Preserved Bottle, EDTA = EDTA Preserved Bottles, ST = Sterile Bottle, ASS = Plastic Bag for Acid Sulphate Soils, B = Unpreserved Bag



CHAIN OF CUSTODY

ALS Laboratory
Please ask →

CLIENT: Cavvanba Consulting	TURNAROUND REQUIREMENTS : * Standard TAT (List due date): (Standard TAT may be longer for some tests e.g. Ultra Trace Organics) <input type="checkbox"/> Non Standard or urgent TAT (List due date):	FOR LABORATORY USE ONLY (Circle) Custody Seal Intact? Yes No (N/A) Frozen ice bricks present upon receipt? YES No (N/A) Random Sample Temperature on Receipt: 2.0 °C Other comment:
OFFICE: Newcastle	ALS QUOTE NO.: SY/159/20	
PROJECT: 20025.76	CONTACT PH: 0403 689 755	
ORDER NUMBER: 20025.76	SAMPLER MOBILE: 0434 376 146	
PROJECT MANAGER: Drew Wood	RELINQUISHED BY: M. Wright	RECEIVED BY: AL
SAMPLER: Michael Wright / Drew Wood	DATE/TIME: 9/27/21 13:36	DATE/TIME: 9/7/21 1:37pm
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	RELINQUISHED BY:
Email Reports to (will default to PM if no other addresses are listed): drew@cavvanba.com, michael@cavvanba.com		RECEIVED BY: Fami
Email Invoice to (will default to PM if no other addresses are listed): rob@cavvanba.com		DATE/TIME: 12/7/21

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)					Additional Information
	MATRIX: SOLID (S) WATER (W)					W - TRHBTEXTX (W-10)	W - Metals (B)	S - Lead only	TRHBTEXTX		
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	(refer)	TOTAL CONTAINERS					Comments on likely contaminants levels, dilutions, or samples requiring specific COC analysis etc
18	TP21 0.9-1.0	6.7.21	Sol	1 X Jar		1					
19	↓ 1.4-1.5										
20	TP22 0.0-0.05										
21	↓ 0.3-0.4										
22	↓ 0.9-1.0										
23	TP23 0.0-0.05										
24	↓ 0.9-1.0										
25	↓ 1.4-1.5										
26	↓ 1.9-2.0										
27	TP24 0.0-0.05										
28	↓ 0.4-0.5										
29	↓ 0.9-1.0										
30	TP25 0.0-0.05										
31	↓ 0.4-0.5										
32	↓ 0.9-1.0										
33	TP26 0.0-0.05										
34	↓ 0.4-0.5										

Water Container Codes: P = Unpreserved Plastic, N = Nitric Preserved Plastic, ORC = Nitric Preserved ORC, SH = Sodium Hydroxide/Cd Preserved, S = Sodium Hydroxide Preserved Plastic, AG = Amber Glass Unpreserved, AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved, VB = VOA Vial Sodium Bisphosphate Preserved, VS = VOA Vial Sulfuric Preserved, AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass, -H = HCl preserved Plastic, HS = HCl preserved Speciation bottle, SP = Sulfuric Preserved Plastic, F = Formaldehyde Preserved Glass
Z = Zinc Acetate Preserved Bottle, E = EDTA Preserved Bottles, ST = Sterile Bottle, ASS = Plastic Bag for Acid Sulphate Soils, B = Unpreserved Bag



CHAIN OF CUSTODY

ALS Laboratory
Please lock →

CLIENT: Cavvanba Consulting

OFFICE: Newcastle

PROJECT: 20025.76

ORDER NUMBER: 20025.76

PROJECT MANAGER: Drew Wood

SAMPLER: Michael Wright / Drew Wood

COC emailed to ALS? (YES / NO)

Email Reports to (will default to PM if no other addresses are listed): drew@cavvanba.com, michael@cavvanba.com

Email Invoice to (will default to PM if no other addresses are listed): rob@cavvanba.com

TURNAROUND REQUIREMENTS:

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

* Standard TAT (List due date):

Non Standard or urgent TAT (List due date):

ALS QUOTE NO.:

SY159/20

CONTACT PH: 0403 689 755

SAMPLER MOBILE: 0434 376 146

EDD FORMAT (or default):

RELINQUISHED BY:

M. Wright

DATE/TIME:

9/10/21

RECEIVED BY:

AZ

DATE/TIME:

9/7/21

1:37pm

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No

Fragile / frozen ice bricks present upon receipt? Yes No

Random Sample Temperature on Receipt: °C

Other comment:

-2.0

RELINQUISHED BY:

DATE/TIME:

RECEIVED BY:

DATE/TIME:

12/11/21

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB Suite Codes must be listed to attract Suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)							Additional Information		
	LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	W - TRIBTEXMPAH/VOCS (W-10)	W - Metals (6)	S - Lead only	TRIBTEXN					
	75	TP26 0.9-1.0	6.7.21	Soil	1 x Jar										
	76	TP27 0.0-0.05													
	77	↓ 0.4-0.5													
	78	↓ 1.4-1.5													
	79	TP28 0.0-0.05													
	80	↓ 0.9-1.0													
	41	↓ 1.9-2.0													
	42	TP29 0.0-0.05													
	43	↓ 0.4-0.5													
	44	↓ 0.9-1.0													
	45	TP30 0.0-0.05													
	46	↓ 0.4-0.5													
	47	↓ 1.4-1.5													
	48	TP31 0.0-0.05													
	49	↓ 0.4-0.5													
	50	↓ 0.9-1.0													
	51	TP32 0.0-0.05													

Water Container Codes: P = Unpreserved Plastic, N = Nitro Preserved Plastic, ORC = Nitric Preserved ORC, SH = Sodium Hydroxide/Cd Preserved, S = Sodium Hydroxide Preserved Plastic, AG = Amber Glass Unpreserved, AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved, VB = VOA Vial Sodium Bisulphate Preserved, VS = VOA Vial Sulfuric Preserved, AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass, H = HCl preserved Plastic, HS = HCl preserved Speciation bottle, SP = Sulfuric Preserved Plastic, F = Formaldehyde Preserved Glass
Z = Zinc Acetate Preserved Bottle, E = EDTA Preserved Bottles, ST = Sterile Bottle, ASS = Plastic Bag for Acid Sulphate Soils, B = Unpreserved Bag

CERTIFICATE OF ANALYSIS

Work Order : **ES2125612**
Client : **CAVVANBA CONSULTING**
Contact : MR DREW WOOD
Address : PO Box 322
 NEWCASTLE 2300
Telephone : +61 02 6685 7811
Project : 20025.76
Order number : 20025.76
C-O-C number : ----
Sampler : DREW WOOD, MICHAEL WRIGHT
Site : ----
Quote number : SY/159/20
No. of samples received : 6
No. of samples analysed : 6

Page : 1 of 11
Laboratory : Environmental Division Sydney
Contact : Brenda Hong
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164

Telephone : +61 2 8784 8555
Date Samples Received : 09-Jul-2021 13:37
Date Analysis Commenced : 12-Jul-2021
Issue Date : 16-Jul-2021 15:47



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP074: Where reported, Total Trihalomethanes is the sum of the reported concentrations of all Trihalomethanes at or above the LOR.
- EP074: Where reported, Total Trimethylbenzenes is the sum of the reported concentrations of 1.2.3-Trimethylbenzene, 1.2.4-Trimethylbenzene and 1.3.5-Trimethylbenzene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EP074&80: Positive result for ES2125612-02 has been confirmed by re-analysis.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	W2	MW02	MW09	MW10	QW01
Sampling date / time				05-Jul-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2125612-001	ES2125612-002	ES2125612-003	ES2125612-004	ES2125612-005	
				Result	Result	Result	Result	Result	
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L	<0.001	0.001	<0.001	<0.001	<0.001	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Chromium	7440-47-3	0.001	mg/L	0.040	<0.001	0.014	<0.001	<0.001	
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Nickel	7440-02-0	0.001	mg/L	<0.001	0.002	<0.001	<0.001	<0.001	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Zinc	7440-66-6	0.005	mg/L	<0.005	0.008	0.006	<0.005	<0.005	
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	5	µg/L	<5	<5	<5	<5	<5	
Isopropylbenzene	98-82-8	5	µg/L	<5	<5	<5	<5	<5	
n-Propylbenzene	103-65-1	5	µg/L	<5	<5	<5	<5	<5	
1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	<5	<5	<5	
sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	<5	<5	<5	
1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	<5	<5	<5	
tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	<5	<5	<5	
p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	<5	<5	<5	
n-Butylbenzene	104-51-8	5	µg/L	<5	<5	<5	<5	<5	
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	50	µg/L	<50	<50	<50	<50	<50	
2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	<50	<50	<50	
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	<50	<50	<50	
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	<50	<50	<50	
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	5	µg/L	<5	<5	<5	<5	<5	
EP074D: Fumigants									
2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	<5	<5	<5	
1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	<5	<5	<5	
cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	<5	<5	<5	
trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	<5	<5	<5	
1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	<5	<5	<5	
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	<50	<50	<50	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	W2	MW02	MW09	MW10	QW01
Sampling date / time					05-Jul-2021 00:00				
Compound	CAS Number	LOR	Unit		ES2125612-001	ES2125612-002	ES2125612-003	ES2125612-004	ES2125612-005
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued									
Chloromethane	74-87-3	50	µg/L		<50	<50	<50	<50	<50
Vinyl chloride	75-01-4	50	µg/L		<50	<50	<50	<50	<50
Bromomethane	74-83-9	50	µg/L		<50	<50	<50	<50	<50
Chloroethane	75-00-3	50	µg/L		<50	<50	<50	<50	<50
Trichlorofluoromethane	75-69-4	50	µg/L		<50	<50	<50	<50	<50
1,1-Dichloroethene	75-35-4	5	µg/L		<5	<5	<5	<5	<5
Iodomethane	74-88-4	5	µg/L		<5	<5	<5	<5	<5
trans-1,2-Dichloroethene	156-60-5	5	µg/L		<5	<5	<5	<5	<5
1,1-Dichloroethane	75-34-3	5	µg/L		<5	<5	<5	<5	<5
cis-1,2-Dichloroethene	156-59-2	5	µg/L		<5	<5	<5	<5	<5
1,1,1-Trichloroethane	71-55-6	5	µg/L		<5	<5	<5	<5	<5
1,1-Dichloropropylene	563-58-6	5	µg/L		<5	<5	<5	<5	<5
Carbon Tetrachloride	56-23-5	5	µg/L		<5	<5	<5	<5	<5
1,2-Dichloroethane	107-06-2	5	µg/L		<5	<5	<5	<5	<5
Trichloroethene	79-01-6	5	µg/L		<5	<5	<5	<5	<5
Dibromomethane	74-95-3	5	µg/L		<5	<5	<5	<5	<5
1,1,2-Trichloroethane	79-00-5	5	µg/L		<5	<5	<5	<5	<5
1,3-Dichloropropane	142-28-9	5	µg/L		<5	<5	<5	<5	<5
Tetrachloroethene	127-18-4	5	µg/L		<5	<5	<5	<5	<5
1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L		<5	<5	<5	<5	<5
trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L		<5	<5	<5	<5	<5
cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L		<5	<5	<5	<5	<5
1,1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L		<5	<5	<5	<5	<5
1,2,3-Trichloropropane	96-18-4	5	µg/L		<5	<5	<5	<5	<5
Pentachloroethane	76-01-7	5	µg/L		<5	<5	<5	<5	<5
1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L		<5	<5	<5	<5	<5
Hexachlorobutadiene	87-68-3	5	µg/L		<5	<5	<5	<5	<5
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L		<5	<5	<5	<5	<5
Bromobenzene	108-86-1	5	µg/L		<5	<5	<5	<5	<5
2-Chlorotoluene	95-49-8	5	µg/L		<5	<5	<5	<5	<5
4-Chlorotoluene	106-43-4	5	µg/L		<5	<5	<5	<5	<5
1,3-Dichlorobenzene	541-73-1	5	µg/L		<5	<5	<5	<5	<5
1,4-Dichlorobenzene	106-46-7	5	µg/L		<5	<5	<5	<5	<5
1,2-Dichlorobenzene	95-50-1	5	µg/L		<5	<5	<5	<5	<5



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	W2	MW02	MW09	MW10	QW01
Sampling date / time					05-Jul-2021 00:00				
Compound	CAS Number	LOR	Unit	ES2125612-001	ES2125612-002	ES2125612-003	ES2125612-004	ES2125612-005	
				Result	Result	Result	Result	Result	
EP074F: Halogenated Aromatic Compounds - Continued									
1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	<5	<5	<5	
1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	<5	<5	<5	
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L	<5	27	<5	<5	<5	
Bromodichloromethane	75-27-4	5	µg/L	<5	11	<5	<5	<5	
Dibromochloromethane	124-48-1	5	µg/L	<5	<5	<5	<5	<5	
Bromoform	75-25-2	5	µg/L	<5	<5	<5	<5	<5	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	
Indeno(1,2,3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L	<20	30	<20	<20	<20	
C10 - C14 Fraction	----	50	µg/L	<50	160	<50	<50	<50	
C15 - C28 Fraction	----	100	µg/L	<100	760	<100	<100	<100	
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50	
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	920	<50	<50	<50	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	30	<20	<20	<20	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	W2	MW02	MW09	MW10	QW01
Sampling date / time				05-Jul-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2125612-001	ES2125612-002	ES2125612-003	ES2125612-004	ES2125612-005	
				Result	Result	Result	Result	Result	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	30	<20	<20	<20	
>C10 - C16 Fraction	----	100	µg/L	<100	270	<100	<100	<100	
>C16 - C34 Fraction	----	100	µg/L	<100	660	<100	<100	<100	
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	930	<100	<100	<100	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	270	<100	<100	<100	
EP080: BTEXN									
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1	
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2	
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2	
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2	
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2	
^ Total Xylenes	----	2	µg/L	<2	<2	<2	<2	<2	
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1	
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5	
EP074S: VOC Surrogates									
1,2-Dichloroethane-D4	17060-07-0	5	%	109	114	111	105	106	
Toluene-D8	2037-26-5	5	%	112	116	112	108	108	
4-Bromofluorobenzene	460-00-4	5	%	112	116	112	109	108	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%	25.9	26.9	16.9	25.5	23.6	
2-Chlorophenol-D4	93951-73-6	1.0	%	62.9	58.2	51.6	51.8	50.8	
2,4,6-Tribromophenol	118-79-6	1.0	%	69.2	77.9	47.0	50.1	45.6	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%	75.5	61.8	53.7	61.6	55.7	
Anthracene-d10	1719-06-8	1.0	%	91.4	81.1	63.8	76.6	73.2	
4-Terphenyl-d14	1718-51-0	1.0	%	95.3	85.7	63.5	74.9	70.5	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%	109	115	112	106	106	
Toluene-D8	2037-26-5	2	%	110	119	110	106	106	
4-Bromofluorobenzene	460-00-4	2	%	112	120	113	110	109	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW13	----	----	----	----
Sampling date / time				05-Jul-2021 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	ES2125612-006	-----	-----	-----	-----	
				Result	----	----	----	----	
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----	
Chromium	7440-47-3	0.001	mg/L	0.004	----	----	----	----	
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	----	----	
Nickel	7440-02-0	0.001	mg/L	<0.001	----	----	----	----	
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----	
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----	
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----	
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	5	µg/L	<5	----	----	----	----	
Isopropylbenzene	98-82-8	5	µg/L	<5	----	----	----	----	
n-Propylbenzene	103-65-1	5	µg/L	<5	----	----	----	----	
1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	----	----	----	----	
sec-Butylbenzene	135-98-8	5	µg/L	<5	----	----	----	----	
1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	----	----	----	----	
tert-Butylbenzene	98-06-6	5	µg/L	<5	----	----	----	----	
p-Isopropyltoluene	99-87-6	5	µg/L	<5	----	----	----	----	
n-Butylbenzene	104-51-8	5	µg/L	<5	----	----	----	----	
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	50	µg/L	<50	----	----	----	----	
2-Butanone (MEK)	78-93-3	50	µg/L	<50	----	----	----	----	
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	----	----	----	----	
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	----	----	----	----	
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	5	µg/L	<5	----	----	----	----	
EP074D: Fumigants									
2,2-Dichloropropane	594-20-7	5	µg/L	<5	----	----	----	----	
1,2-Dichloropropane	78-87-5	5	µg/L	<5	----	----	----	----	
cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	----	----	----	----	
trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	----	----	----	----	
1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	----	----	----	----	
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L	<50	----	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW13	----	----	----	----
Sampling date / time				05-Jul-2021 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	ES2125612-006	-----	-----	-----	-----	
				Result	----	----	----	----	
EP074E: Halogenated Aliphatic Compounds - Continued									
Chloromethane	74-87-3	50	µg/L	<50	----	----	----	----	
Vinyl chloride	75-01-4	50	µg/L	<50	----	----	----	----	
Bromomethane	74-83-9	50	µg/L	<50	----	----	----	----	
Chloroethane	75-00-3	50	µg/L	<50	----	----	----	----	
Trichlorofluoromethane	75-69-4	50	µg/L	<50	----	----	----	----	
1,1-Dichloroethene	75-35-4	5	µg/L	<5	----	----	----	----	
Iodomethane	74-88-4	5	µg/L	<5	----	----	----	----	
trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	----	----	----	----	
1,1-Dichloroethane	75-34-3	5	µg/L	<5	----	----	----	----	
cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	----	----	----	----	
1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	----	----	----	----	
1,1-Dichloropropylene	563-58-6	5	µg/L	<5	----	----	----	----	
Carbon Tetrachloride	56-23-5	5	µg/L	<5	----	----	----	----	
1,2-Dichloroethane	107-06-2	5	µg/L	<5	----	----	----	----	
Trichloroethene	79-01-6	5	µg/L	<5	----	----	----	----	
Dibromomethane	74-95-3	5	µg/L	<5	----	----	----	----	
1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	----	----	----	----	
1,3-Dichloropropane	142-28-9	5	µg/L	<5	----	----	----	----	
Tetrachloroethene	127-18-4	5	µg/L	<5	----	----	----	----	
1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	----	----	----	----	
trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	----	----	----	----	
cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	----	----	----	----	
1,1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	----	----	----	----	
1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	----	----	----	----	
Pentachloroethane	76-01-7	5	µg/L	<5	----	----	----	----	
1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	----	----	----	----	
Hexachlorobutadiene	87-68-3	5	µg/L	<5	----	----	----	----	
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L	<5	----	----	----	----	
Bromobenzene	108-86-1	5	µg/L	<5	----	----	----	----	
2-Chlorotoluene	95-49-8	5	µg/L	<5	----	----	----	----	
4-Chlorotoluene	106-43-4	5	µg/L	<5	----	----	----	----	
1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	----	----	----	----	
1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	----	----	----	----	
1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	----	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW13	----	----	----	----
Sampling date / time			05-Jul-2021 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	ES2125612-006	-----	-----	-----	-----
				Result	----	----	----	----
EP074F: Halogenated Aromatic Compounds - Continued								
1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	----	----	----	----
1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	----	----	----	----
EP074G: Trihalomethanes								
Chloroform	67-66-3	5	µg/L	<5	----	----	----	----
Bromodichloromethane	75-27-4	5	µg/L	<5	----	----	----	----
Dibromochloromethane	124-48-1	5	µg/L	<5	----	----	----	----
Bromoform	75-25-2	5	µg/L	<5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	----	----	----	----
Benzo(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1,2,3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	----	----	----	----
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW13	----	----	----	----
Sampling date / time			05-Jul-2021 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	ES2125612-006	-----	-----	-----	-----
				Result	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued								
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
^ Total Xylenes	----	2	µg/L	<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----
EP074S: VOC Surrogates								
1,2-Dichloroethane-D4	17060-07-0	5	%	105	----	----	----	----
Toluene-D8	2037-26-5	5	%	107	----	----	----	----
4-Bromofluorobenzene	460-00-4	5	%	108	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1.0	%	26.5	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1.0	%	54.6	----	----	----	----
2,4,6-Tribromophenol	118-79-6	1.0	%	46.3	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1.0	%	64.5	----	----	----	----
Anthracene-d10	1719-06-8	1.0	%	77.8	----	----	----	----
4-Terphenyl-d14	1718-51-0	1.0	%	76.8	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	2	%	106	----	----	----	----
Toluene-D8	2037-26-5	2	%	105	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	109	----	----	----	----



Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP074S: VOC Surrogates			
1,2-Dichloroethane-D4	17060-07-0	78	133
Toluene-D8	2037-26-5	79	129
4-Bromofluorobenzene	460-00-4	81	124
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2,4,6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

QUALITY CONTROL REPORT

Work Order	: ES2125612	Page	: 1 of 11
Client	: CAVVANBA CONSULTING	Laboratory	: Environmental Division Sydney
Contact	: MR DREW WOOD	Contact	: Brenda Hong
Address	: PO Box 322 NEWCASTLE 2300	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 6685 7811	Telephone	: +61 2 8784 8555
Project	: 20025.76	Date Samples Received	: 09-Jul-2021
Order number	: 20025.76	Date Analysis Commenced	: 12-Jul-2021
C-O-C number	: ----	Issue Date	: 16-Jul-2021
Sampler	: DREW WOOD, MICHAEL WRIGHT		
Site	: ----		
Quote number	: SY/159/20		
No. of samples received	: 6		
No. of samples analysed	: 6		



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 3789941)									
ES2125375-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.112	0.110	1.3	0% - 20%
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.066	0.068	2.0	0% - 20%
		EG020A-F: Lead	7439-92-1	0.001	mg/L	0.007	0.002	97.2	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.011	0.011	0.0	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.053	0.053	0.0	0% - 50%
ES2125449-002	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 3789946)									
ES2125635-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.002	0.003	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.002	0.003	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.038	0.049	26.8	No Limit
EW2102976-004	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 3789946) - continued									
EW2102976-004	Anonymous	EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.014	0.014	0.0	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.008	0.008	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 3789943)									
ES2125449-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2125515-004	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 3789945)									
ES2125612-006	MW13	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3787702)									
ES2125603-001	Anonymous	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
ES2125612-005	QW01	EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
ES2125603-001	Anonymous	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
ES2125612-005	QW01	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
EP074C: Sulfonated Compounds (QC Lot: 3787702)									
ES2125603-001	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP074C: Sulfonated Compounds (QC Lot: 3787702) - continued									
ES2125612-005	QW01	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
EP074D: Fumigants (QC Lot: 3787702)									
ES2125603-001	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
ES2125612-005	QW01	EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 3787702)									
ES2125603-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit		
EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit		



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP074E: Halogenated Aliphatic Compounds (QC Lot: 3787702) - continued									
ES2125603-001	Anonymous	EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit
ES2125612-005	QW01	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit		
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit		
EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit		
EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit		
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit		
EP074F: Halogenated Aromatic Compounds (QC Lot: 3787702)									
ES2125603-001	Anonymous	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
ES2125612-005	QW01	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)	
EP074F: Halogenated Aromatic Compounds (QC Lot: 3787702) - continued										
ES2125612-005	QW01	EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit	
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit	
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit	
		EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit	
		EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit	
		EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit	
		EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit	
		EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit	
EP074G: Trihalomethanes (QC Lot: 3787702)										
ES2125603-001	Anonymous	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit	
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit	
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit	
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit	
ES2125612-005	QW01	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit	
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit	
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit	
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit	
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3787703)										
ES2125603-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit	
ES2125612-005	QW01	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3787703)										
ES2125603-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit	
ES2125612-005	QW01	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit	
EP080: BTEXN (QC Lot: 3787703)										
ES2125603-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit	
ES2125612-005	QW01	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit	



Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EG020F: Dissolved Metals by ICP-MS (QCLot: 3789941)									
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	90.6	85.0	114	
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	91.1	84.0	110	
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	91.6	85.0	111	
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	90.5	81.0	111	
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	89.9	83.0	111	
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	88.4	82.0	112	
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	89.4	81.0	117	
EG020F: Dissolved Metals by ICP-MS (QCLot: 3789946)									
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	88.1	85.0	114	
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	88.0	84.0	110	
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	90.3	85.0	111	
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	88.0	81.0	111	
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	87.8	83.0	111	
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	86.9	82.0	112	
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	86.6	81.0	117	
EG035F: Dissolved Mercury by FIMS (QCLot: 3789943)									
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	96.4	83.0	105	
EG035F: Dissolved Mercury by FIMS (QCLot: 3789945)									
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	97.8	83.0	105	
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3787702)									
EP074: Styrene	100-42-5	5	µg/L	<5	10 µg/L	85.1	73.0	119	
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	10 µg/L	95.6	76.0	118	
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	10 µg/L	93.9	69.0	119	
EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	10 µg/L	94.1	74.0	116	
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	10 µg/L	97.7	73.0	119	
EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	10 µg/L	93.1	74.0	116	
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	10 µg/L	93.6	72.0	116	
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	10 µg/L	97.2	71.0	119	
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	10 µg/L	96.0	65.0	123	
EP074B: Oxygenated Compounds (QCLot: 3787702)									
EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	100 µg/L	97.4	61.4	134	
EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	100 µg/L	77.9	73.6	130	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	100 µg/L	89.4	66.0	132	
EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	100 µg/L	73.0	65.0	137	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	High
EP074C: Sulfonated Compounds (QCLot: 3787702)									
EP074: Carbon disulfide	75-15-0	5	µg/L	<5	10 µg/L	89.1	72.8	127	
EP074D: Fumigants (QCLot: 3787702)									
EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	10 µg/L	97.6	68.0	122	
EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	10 µg/L	89.0	76.0	118	
EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	10 µg/L	87.0	62.0	120	
EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	10 µg/L	87.6	60.0	114	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	10 µg/L	93.3	69.0	117	
EP074E: Halogenated Aliphatic Compounds (QCLot: 3787702)									
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	100 µg/L	82.6	60.6	138	
EP074: Chloromethane	74-87-3	50	µg/L	<50	100 µg/L	84.9	67.4	130	
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	100 µg/L	91.6	69.4	129	
EP074: Bromomethane	74-83-9	50	µg/L	<50	100 µg/L	85.5	56.0	140	
EP074: Chloroethane	75-00-3	50	µg/L	<50	100 µg/L	91.6	61.0	139	
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	100 µg/L	94.8	69.0	131	
EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	10 µg/L	93.2	70.0	124	
EP074: Iodomethane	74-88-4	5	µg/L	<5	10 µg/L	72.0	70.2	128	
EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	10 µg/L	92.8	74.0	118	
EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	10 µg/L	89.5	74.0	120	
EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	10 µg/L	88.5	77.0	119	
EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	10 µg/L	94.1	67.0	119	
EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	10 µg/L	93.8	73.0	119	
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	10 µg/L	94.5	62.0	120	
EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	10 µg/L	91.5	73.0	123	
EP074: Trichloroethene	79-01-6	5	µg/L	<5	10 µg/L	89.1	76.0	118	
EP074: Dibromomethane	74-95-3	5	µg/L	<5	10 µg/L	90.7	73.0	119	
EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	10 µg/L	92.4	72.0	126	
EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	10 µg/L	91.3	71.0	129	
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	10 µg/L	87.9	72.0	124	
EP074: 1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	10 µg/L	87.8	66.0	114	
EP074: trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	10 µg/L	87.5	60.0	120	
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	10 µg/L	97.3	70.6	128	
EP074: 1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	10 µg/L	94.0	70.0	124	
EP074: 1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	10 µg/L	96.6	74.0	126	
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	10 µg/L	102	71.8	126	
EP074: 1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	10 µg/L	91.7	66.4	136	
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	10 µg/L	97.7	58.0	130	
EP074F: Halogenated Aromatic Compounds (QCLot: 3787702)									
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	10 µg/L	91.7	79.0	117	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Acceptable Limits (%)	
					Concentration	LCS	Low	High	
EP074F: Halogenated Aromatic Compounds (QCLot: 3787702) - continued									
EP074: Bromobenzene	108-86-1	5	µg/L	<5	10 µg/L	91.6	76.0	116	
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	10 µg/L	93.2	73.0	119	
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	10 µg/L	92.9	73.0	119	
EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	10 µg/L	91.9	75.0	117	
EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	10 µg/L	93.5	74.0	118	
EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	10 µg/L	91.1	75.0	117	
EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	10 µg/L	85.7	61.0	125	
EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	10 µg/L	87.5	67.0	123	
EP074G: Trihalomethanes (QCLot: 3787702)									
EP074: Chloroform	67-66-3	5	µg/L	<5	10 µg/L	91.6	72.0	120	
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	10 µg/L	87.4	64.0	118	
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	10 µg/L	88.2	65.0	115	
EP074: Bromoform	75-25-2	5	µg/L	<5	10 µg/L	89.8	73.5	126	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3786937)									
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	72.2	50.0	94.0	
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	83.7	63.6	114	
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	84.8	62.2	113	
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	90.0	63.9	115	
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	82.8	62.6	116	
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	88.6	64.3	116	
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	95.6	63.6	118	
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	98.1	63.1	118	
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	85.7	64.1	117	
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	79.3	62.5	116	
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	1	µg/L	<1.0	5 µg/L	72.5	61.7	119	
	205-82-3								
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	93.8	63.0	115	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	94.4	63.3	117	
EP075(SIM): Indeno(1,2,3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	96.3	59.9	118	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	96.8	61.2	117	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	91.6	59.1	118	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3786938)									
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	78.4	55.8	112	
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	91.6	71.6	113	
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	102	56.0	121	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3787703)									
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	80.1	75.0	127	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3786938)									



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3786938) - continued								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	79.2	57.9	119
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	101	62.5	110
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	88.3	61.5	121
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3787703)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	84.2	75.0	127
EP080: BTEXN (QCLot: 3787703)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	84.7	70.0	122
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	93.6	69.0	123
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	101	70.0	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	100	69.0	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	104	72.0	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	107	70.0	120

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 3789941)							
ES2125375-002	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	93.8	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	93.3	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	94.3	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	99.2	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	103	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	92.5	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	92.9	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 3789946)							
ES2125635-002	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	98.3	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	93.5	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	96.1	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	100	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	101	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	94.0	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	93.9	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 3789943)							



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report				
				Spike	SpikeRecovery(%)	Acceptable Limits (%)		
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
EG035F: Dissolved Mercury by FIMS (QCLot: 3789943) - continued								
ES2125449-003	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	87.1	70.0	130	
EG035F: Dissolved Mercury by FIMS (QCLot: 3789945)								
ES2125612-005	QW01	EG035F: Mercury	7439-97-6	0.01 mg/L	95.3	70.0	130	
EP074E: Halogenated Aliphatic Compounds (QCLot: 3787702)								
ES2125603-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	101	70.0	130	
		EP074: Trichloroethene	79-01-6	25 µg/L	101	70.0	130	
EP074F: Halogenated Aromatic Compounds (QCLot: 3787702)								
ES2125603-001	Anonymous	EP074: Chlorobenzene	108-90-7	25 µg/L	106	70.0	130	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3787703)								
ES2125603-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	118	70.0	130	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3787703)								
ES2125603-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	115	70.0	130	
EP080: BTEXN (QCLot: 3787703)								
ES2125603-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	104	70.0	130	
		EP080: Toluene	108-88-3	25 µg/L	105	70.0	130	
		EP080: Ethylbenzene	100-41-4	25 µg/L	114	70.0	130	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	110	70.0	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	25 µg/L	112	70.0	130	
	EP080: Naphthalene	91-20-3	25 µg/L	101	70.0	130		

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2125612	Page	: 1 of 6
Client	: CAVVANBA CONSULTING	Laboratory	: Environmental Division Sydney
Contact	: MR DREW WOOD	Telephone	: +61 2 8784 8555
Project	: 20025.76	Date Samples Received	: 09-Jul-2021
Site	: ----	Issue Date	: 16-Jul-2021
Sampler	: DREW WOOD, MICHAEL WRIGHT	No. of samples received	: 6
Order number	: 20025.76	No. of samples analysed	: 6

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**



Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	0	8	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	7	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
PAH/Phenols (GC/MS - SIM)	0	8	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	7	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) W2, MW09, QW01, MW02, MW10, MW13	05-Jul-2021	----	----	----	13-Jul-2021	01-Jan-2022	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) W2, MW09, QW01, MW02, MW10, MW13	05-Jul-2021	----	----	----	14-Jul-2021	02-Aug-2021	✓
EP074A: Monocyclic Aromatic Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP074) W2, MW09, QW01, MW02, MW10, MW13	05-Jul-2021	13-Jul-2021	19-Jul-2021	✓	13-Jul-2021	19-Jul-2021	✓
EP074B: Oxygenated Compounds							
Amber VOC Vial - Sulfuric Acid (EP074) W2, MW09, QW01, MW02, MW10, MW13	05-Jul-2021	13-Jul-2021	19-Jul-2021	✓	13-Jul-2021	19-Jul-2021	✓



Matrix: **WATER** Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP074C: Sulfonated Compounds							
Amber VOC Vial - Sulfuric Acid (EP074) W2, MW09, QW01, MW02, MW10, MW13	05-Jul-2021	13-Jul-2021	19-Jul-2021	✓	13-Jul-2021	19-Jul-2021	✓
EP074D: Fumigants							
Amber VOC Vial - Sulfuric Acid (EP074) W2, MW09, QW01, MW02, MW10, MW13	05-Jul-2021	13-Jul-2021	19-Jul-2021	✓	13-Jul-2021	19-Jul-2021	✓
EP074E: Halogenated Aliphatic Compounds							
Amber VOC Vial - Sulfuric Acid (EP074) W2, MW09, QW01, MW02, MW10, MW13	05-Jul-2021	13-Jul-2021	19-Jul-2021	✓	13-Jul-2021	19-Jul-2021	✓
EP074F: Halogenated Aromatic Compounds							
Amber VOC Vial - Sulfuric Acid (EP074) W2, MW09, QW01, MW02, MW10, MW13	05-Jul-2021	13-Jul-2021	19-Jul-2021	✓	13-Jul-2021	19-Jul-2021	✓
EP074G: Trihalomethanes							
Amber VOC Vial - Sulfuric Acid (EP074) W2, MW09, QW01, MW02, MW10, MW13	05-Jul-2021	13-Jul-2021	19-Jul-2021	✓	13-Jul-2021	19-Jul-2021	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM)) W2, MW09, QW01, MW02, MW10, MW13	05-Jul-2021	12-Jul-2021	12-Jul-2021	✓	15-Jul-2021	21-Aug-2021	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) W2, MW09, QW01, MW02, MW10, MW13	05-Jul-2021	12-Jul-2021	12-Jul-2021	✓	15-Jul-2021	21-Aug-2021	✓
Amber VOC Vial - Sulfuric Acid (EP080) W2, MW09, QW01, MW02, MW10, MW13	05-Jul-2021	13-Jul-2021	19-Jul-2021	✓	13-Jul-2021	19-Jul-2021	✓



Matrix: **WATER**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Amber Glass Bottle - Unpreserved (EP071)								
W2, MW09, QW01,	MW02, MW10, MW13	05-Jul-2021	12-Jul-2021	12-Jul-2021	✓	15-Jul-2021	21-Aug-2021	✓
Amber VOC Vial - Sulfuric Acid (EP080)								
W2, MW09, QW01,	MW02, MW10, MW13	05-Jul-2021	13-Jul-2021	19-Jul-2021	✓	13-Jul-2021	19-Jul-2021	✓
EP080: BTEXN								
Amber VOC Vial - Sulfuric Acid (EP080)								
W2, MW09, QW01,	MW02, MW10, MW13	05-Jul-2021	13-Jul-2021	19-Jul-2021	✓	13-Jul-2021	19-Jul-2021	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: ✘ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Dissolved Mercury by FIMS	EG035F	3	24	12.50	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	4	36	11.11	10.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	8	0.00	10.00	✘	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	7	0.00	10.00	✘	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	13	15.38	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	2	13	15.38	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS	EG035F	2	24	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	36	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	8	12.50	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	7	14.29	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	13	7.69	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	13	7.69	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	2	24	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	36	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	8	12.50	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	7	14.29	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	13	7.69	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	13	7.69	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Dissolved Mercury by FIMS	EG035F	2	24	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	36	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	8	0.00	5.00	✘	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	7	0.00	5.00	✘	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	13	7.69	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	13	7.69	5.00	✔	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
Volatile Organic Compounds	EP074	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)
Preparation Methods	Method	Matrix	Method Descriptions
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ES2125612

Client	: CAVVANBA CONSULTING	Laboratory	: Environmental Division Sydney
Contact	: MR DREW WOOD	Contact	: Brenda Hong
Address	: PO Box 322 NEWCASTLE 2300	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: drew@cavvanba.com	E-mail	: Brenda.Hong@ALSGlobal.com
Telephone	: +61 02 6685 7811	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 6685 5083	Facsimile	: +61-2-8784 8500
Project	: 20025.76	Page	: 1 of 2
Order number	: 20025.76	Quote number	: ES2020CAVCON0008 (SY/159/20)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: DREW WOOD, MICHAEL WRIGHT		

Dates

Date Samples Received	: 09-Jul-2021 13:37	Issue Date	: 12-Jul-2021
Client Requested Due Date	: 16-Jul-2021	Scheduled Reporting Date	: 16-Jul-2021

Delivery Details

Mode of Delivery	: Undefined	Security Seal	: Not Available
No. of coolers/boxes	: ----	Temperature	: -2.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **This workorder has been split from ES2125433 and ES2125613.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



Sample Container(s)/Preservation Non-Compliances

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

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - W-02 8 Metals	WATER - W-10 TRH/VOC/PAH
ES2125612-001	05-Jul-2021 00:00	W2	✓	✓
ES2125612-002	05-Jul-2021 00:00	MW02	✓	✓
ES2125612-003	05-Jul-2021 00:00	MW09	✓	✓
ES2125612-004	05-Jul-2021 00:00	MW10	✓	✓
ES2125612-005	05-Jul-2021 00:00	QW01	✓	✓
ES2125612-006	05-Jul-2021 00:00	MW13	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)

Email inbox@cavvanba.com

DREW WOOD

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- Chain of Custody (CoC) (COC)
- EDI Format - ENMRG (ENMRG)
- EDI Format - ESDAT (ESDAT)

Email drew@cavvanba.com
 Email drew@cavvanba.com
 Email drew@cavvanba.com
 Email drew@cavvanba.com
 Email drew@cavvanba.com
 Email drew@cavvanba.com

MICHAEL WRIGHT

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- Chain of Custody (CoC) (COC)
- EDI Format - ENMRG (ENMRG)
- EDI Format - ESDAT (ESDAT)

Email michael@cavvanba.com
 Email michael@cavvanba.com
 Email michael@cavvanba.com
 Email michael@cavvanba.com
 Email michael@cavvanba.com
 Email michael@cavvanba.com

ROB MCLELLAND

- A4 - AU Tax Invoice (INV)

Email rob@cavvanba.com



CHAIN OF CUSTODY

ALS Laboratory
61666 TXA

CLIENT: Cavvanba Consulting	TURNAROUND REQUIREMENTS: <input checked="" type="checkbox"/> Standard TAT (List due date): (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	FOR LABORATORY USE ONLY (Circle)	
OFFICE: Newcastle	<input type="checkbox"/> Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A	
PROJECT: 20025.76	ALS QUOTE NO.: SY/159/20	Frozen / Broken Ice bricks present upon receipt? YES No N/A	
ORDER NUMBER: 20025.76		Random Sample Temperature on Receipt: °C -2.0	
PROJECT MANAGER: Drew Wood	CONTACT PH: 0403 689 755	Other comment: -2.0	
SAMPLER: Michael Wright / Drew Wood	SAMPLER MOBILE: 0434 376 146	RECEIVED BY: AC	RECEIVED BY: FW
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	DATE/TIME: 1:37 PM	DATE/TIME: 1/7/21
Email Reports to (will default to PM if no other addresses are listed): drew@cavvanba.com michael@cavvanba.com	RELINQUISHED BY: M. Wright		
Email Invoice to (will default to PM if no other addresses are listed): roo@cavvanba.com	DATE/TIME: 3:36		

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS			CONTAINER INFORMATION	ANALYSIS REQUIRED including SUITES (N.B. Suite Codes must be listed to attract suite price) (Where Metals are required specify Total (unfiltered bottle required) or Dissolved (filtered bottle required))					Additional Information	
	MATRIX: SOLID (S) WATER (W)										
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (to codes below)	(refer)	TOTAL CONTAINERS	W. TRIBITEXAN/PAH/VOCS (W-10)	W. Metals (8)	S. Lead only	TRIBITEXAN	Comments on likely contaminants, levels, solutions, or samples requiring specific QC analysis etc.
	W3	7.7.21	Water	2V, 1A, 1P		4	/	/			
	MW01	↓					/	/			
2	MW02	5.7.21					/	/			Dates on COC are correct.
	MW03	9.7.21					/	/			
	MW04	↓					/	/			
	MW05	↓					/	/			
	MW06	7.7.21					/	/			
	MW07	↓					/	/			
	MW08	↓					/	/			
3	MW09	5.7.21					/	/			
4	MW10	↓					/	/			
	MW11	7.7.21					/	/			
5	QW01	5.7.21					/	/			
*	QW02	↓					/	/			Please send QW02 to ERM
	Triplicate			1 x each		1					
	Tripplicate			1 x each		1					
	MW12	7.7.21		2V, 1A, 1P		4	/	/			

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SP = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airtight unpreserved Plastic
 V = VOA Via HCl Preserved; VB = VOA Via Sodium Bisulfate - preserved; VS = VOA Via Sulfuric Preserved; AV = Airtight Unpreserved via SO₂; B = Boric Preserved; Amber Glass; H = HCl Preserved Plastic; HS = HCl preserved Eppendorf bottle; SP = Sulfuric Preserved Plastic; P = Polytetrafluorethylene Glass
 T = 10 Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Solids; B = unpreserved Bag

CERTIFICATE OF ANALYSIS

Work Order : **ES2125613**
Client : **CAVVANBA CONSULTING**
Contact : MR DREW WOOD
Address : PO Box 322
 NEWCASTLE 2300
Telephone : +61 02 6685 7811
Project : 20025.76
Order number : 20025.76
C-O-C number : ----
Sampler : DREW WOOD, MICHAEL WRIGHT
Site : ----
Quote number : SY/159/20
No. of samples received : 60
No. of samples analysed : 42

Page : 1 of 23
Laboratory : Environmental Division Sydney
Contact : Brenda Hong
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164

Telephone : +61 2 8784 8555
Date Samples Received : 09-Jul-2021 13:37
Date Analysis Commenced : 13-Jul-2021
Issue Date : 19-Jul-2021 16:33



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Brendan Schrader	Laboratory Technician	Newcastle - Asbestos, Mayfield West, NSW
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP074: Where reported, Total Trihalomethanes is the sum of the reported concentrations of all Trihalomethanes at or above the LOR.
- EP074: Where reported, Total Trimethylbenzenes is the sum of the reported concentrations of 1.2.3-Trimethylbenzene, 1.2.4-Trimethylbenzene and 1.3.5-Trimethylbenzene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EG005: Poor precision was obtained for lead on sample ES2125613-18. Results have been confirmed by re-extraction and reanalysis.
- EP074/EP080: Result for MW06 has been confirmed.
- **EA200 Legend**
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EP080: The trip spike and its control have been analysed for volatile TPH and BTEXN only. The trip spike and control were prepared in the lab using reagent grade sand spiked with petrol. The spike was dispatched from the lab and the control retained.
- EP080: Sample TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEXN compounds spiked at 20 ug/L.
- EA200: N/A - Not Applicable



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP33 0.0-0.05	TP33 0.4-0.5	TP34 0.0-0.05	TP34 0.4-0.5	TP35 0.0-0.05
Sampling date / time				06-Jul-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2125613-003	ES2125613-004	ES2125613-006	ES2125613-007	ES2125613-009	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	16.3	15.6	20.8	28.6	25.5	
EG005(ED093)T: Total Metals by ICP-AES									
Lead	7439-92-1	5	mg/kg	118	36	500	506	235	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP35 0.4-0.5	TP36 0.0-0.05	TP36 0.9-1.0	TP37 0.0-0.05	TP38 0.0-0.05
Sampling date / time				06-Jul-2021 00:00	06-Jul-2021 00:00	06-Jul-2021 00:00	07-Jul-2021 00:00	07-Jul-2021 00:00	07-Jul-2021 00:00
Compound	CAS Number	LOR	Unit	ES2125613-010	ES2125613-012	ES2125613-013	ES2125613-015	ES2125613-018	ES2125613-018
				Result	Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	13.6	16.8	14.2	19.8	18.3	18.3
EG005(ED093)T: Total Metals by ICP-AES									
Lead	7439-92-1	5	mg/kg	272	247	85	742	18	18



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP39 0.0-0.05	TP39 0.3-0.4	TP40 0.0-0.05	TP41 0.0-0.05	TP42 0.0-0.05
Sampling date / time				07-Jul-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2125613-021	ES2125613-022	ES2125613-024	ES2125613-027	ES2125613-029	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	22.2	15.4	20.2	20.6	20.8	
EG005(ED093)T: Total Metals by ICP-AES									
Lead	7439-92-1	5	mg/kg	229	90	329	72	124	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP42 0.4-0.5	TP43 0.0-0.05	TP43 0.9-1.0	TP44 0.0-0.05	TP44 0.4-0.5
Sampling date / time				07-Jul-2021 00:00					
Compound	CAS Number	LOR	Unit	ES2125613-030	ES2125613-032	ES2125613-034	ES2125613-035	ES2125613-036	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	18.8	26.9	18.1	17.5	26.6	
EG005(ED093)T: Total Metals by ICP-AES									
Lead	7439-92-1	5	mg/kg	157	148	24	360	353	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP45 0.0-0.05	TP45 0.2-0.3	QS01	QS03	QS05
Sampling date / time				07-Jul-2021 00:00	07-Jul-2021 00:00	06-Jul-2021 00:00	06-Jul-2021 00:00	06-Jul-2021 00:00	
Compound	CAS Number	LOR	Unit	ES2125613-038	ES2125613-039	ES2125613-041	ES2125613-043	ES2125613-045	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	20.0	26.3	12.5	25.6	19.8	
EG005(ED093)T: Total Metals by ICP-AES									
Lead	7439-92-1	5	mg/kg	164	33	333	278	107	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	Tripblank	TripSpike	Trip Spike Control	----	----
Sampling date / time				08-Jul-2021 00:00	05-Jul-2021 00:00	05-Jul-2021 00:00	----	----	
Compound	CAS Number	LOR	Unit	ES2125613-048	ES2125613-049	ES2125613-063	-----	-----	
				Result	Result	Result	----	----	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg	<10	----	----	----	----	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	----	----	----	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	----	----	----	----	
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	----	----	
Toluene	108-88-3	0.5	mg/kg	<0.5	12.8	15.0	----	----	
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2.3	2.7	----	----	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	11.4	13.1	----	----	
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	4.8	5.2	----	----	
^ Sum of BTEX	----	0.2	mg/kg	<0.2	31.3	36.0	----	----	
^ Total Xylenes	----	0.5	mg/kg	<0.5	16.2	18.3	----	----	
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	----	----	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	128	121	115	----	----	
Toluene-D8	2037-26-5	0.2	%	118	121	116	----	----	
4-Bromofluorobenzene	460-00-4	0.2	%	123	114	109	----	----	



Analytical Results

Sub-Matrix: SOLID (Matrix: SOLID)				Sample ID	ACM01	----	----	----	----
Sampling date / time				06-Jul-2021 00:00	----	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2125613-047	-----	-----	-----	-----	-----
Result				Result	----	----	----	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples									
Asbestos Detected	1332-21-4	0.1	g/kg	Yes	----	----	----	----	----
Asbestos Type	1332-21-4	-	--	Ch	----	----	----	----	----
Asbestos (Trace)	1332-21-4	5	Fibres	N/A	----	----	----	----	----
Sample weight (dry)	----	0.01	g	58.2	----	----	----	----	----
Synthetic Mineral Fibre	----	0.1	g/kg	No	----	----	----	----	----
Organic Fibre	----	0.1	g/kg	No	----	----	----	----	----
APPROVED IDENTIFIER:	----	-	--	J.SPOONER	----	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	W1	W3 Received as W2	MW01	MW03	MW04
Sampling date / time				07-Jul-2021 00:00	07-Jul-2021 00:00	07-Jul-2021 00:00	08-Jul-2021 00:00	08-Jul-2021 00:00	
Compound	CAS Number	LOR	Unit	ES2125613-050	ES2125613-051	ES2125613-052	ES2125613-053	ES2125613-054	
				Result	Result	Result	Result	Result	
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Chromium	7440-47-3	0.001	mg/L	0.001	0.004	<0.001	0.002	0.003	
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.001	<0.001	<0.001	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Zinc	7440-66-6	0.005	mg/L	0.022	<0.005	0.007	0.006	<0.005	
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	5	µg/L	<5	<5	<5	<5	<5	
Isopropylbenzene	98-82-8	5	µg/L	<5	<5	<5	<5	<5	
n-Propylbenzene	103-65-1	5	µg/L	<5	<5	<5	<5	<5	
1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	<5	<5	<5	
sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	<5	<5	<5	
1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	<5	<5	<5	
tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	<5	<5	<5	
p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	<5	<5	<5	
n-Butylbenzene	104-51-8	5	µg/L	<5	<5	<5	<5	<5	
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	50	µg/L	<50	<50	<50	<50	<50	
2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	<50	<50	<50	
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	<50	<50	<50	
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	<50	<50	<50	
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	5	µg/L	<5	<5	<5	<5	<5	
EP074D: Fumigants									
2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	<5	<5	<5	
1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	<5	<5	<5	
cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	<5	<5	<5	
trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	<5	<5	<5	
1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	<5	<5	<5	
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	<50	<50	<50	



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Sample ID

				W1	W3	MW01	MW03	MW04
				07-Jul-2021 00:00	07-Jul-2021 00:00	07-Jul-2021 00:00	08-Jul-2021 00:00	08-Jul-2021 00:00
Compound	CAS Number	LOR	Unit	ES2125613-050	ES2125613-051	ES2125613-052	ES2125613-053	ES2125613-054
				Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued								
Chloromethane	74-87-3	50	µg/L	<50	<50	<50	<50	<50
Vinyl chloride	75-01-4	50	µg/L	<50	<50	<50	<50	<50
Bromomethane	74-83-9	50	µg/L	<50	<50	<50	<50	<50
Chloroethane	75-00-3	50	µg/L	<50	<50	<50	<50	<50
Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	<50	<50	<50
1,1-Dichloroethene	75-35-4	5	µg/L	<5	<5	<5	<5	<5
Iodomethane	74-88-4	5	µg/L	<5	<5	<5	<5	<5
trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	<5	<5	<5	<5
1,1-Dichloroethane	75-34-3	5	µg/L	<5	<5	<5	<5	<5
cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	<5	<5	<5	<5
1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	<5	<5	<5	<5
1,1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	<5	<5	<5
Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	<5	<5	<5
1,2-Dichloroethane	107-06-2	5	µg/L	<5	<5	<5	<5	<5
Trichloroethene	79-01-6	5	µg/L	<5	<5	<5	<5	<5
Dibromomethane	74-95-3	5	µg/L	<5	<5	<5	<5	<5
1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	<5	<5	<5	<5
1,3-Dichloropropane	142-28-9	5	µg/L	<5	<5	<5	<5	<5
Tetrachloroethene	127-18-4	5	µg/L	<5	<5	<5	<5	<5
1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	<5	<5	<5
trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	<5	<5	<5
cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	<5	<5	<5
1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	<5	<5	<5	<5
Pentachloroethane	76-01-7	5	µg/L	<5	<5	<5	<5	<5
1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	<5	<5	<5
Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	<5	<5	<5
EP074F: Halogenated Aromatic Compounds								
Chlorobenzene	108-90-7	5	µg/L	<5	<5	<5	<5	<5
Bromobenzene	108-86-1	5	µg/L	<5	<5	<5	<5	<5
2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	<5	<5	<5
4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	<5	<5	<5
1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	<5	<5	<5
1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	<5	<5	<5



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	W1	W3 Received as W2	MW01	MW03	MW04
Sampling date / time				07-Jul-2021 00:00	07-Jul-2021 00:00	07-Jul-2021 00:00	08-Jul-2021 00:00	08-Jul-2021 00:00	
Compound	CAS Number	LOR	Unit	ES2125613-050	ES2125613-051	ES2125613-052	ES2125613-053	ES2125613-054	
				Result	Result	Result	Result	Result	
EP074F: Halogenated Aromatic Compounds - Continued									
1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	<5	<5	<5	
1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	<5	<5	<5	
1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	<5	<5	<5	
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L	<5	<5	<5	<5	<5	
Bromodichloromethane	75-27-4	5	µg/L	<5	<5	<5	<5	<5	
Dibromochloromethane	124-48-1	5	µg/L	<5	<5	<5	<5	<5	
Bromoform	75-25-2	5	µg/L	<5	<5	<5	<5	<5	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	
Indeno(1,2,3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20	
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50	
C15 - C28 Fraction	----	100	µg/L	<100	<100	480	<100	<100	
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50	
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	480	<50	<50	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	W1	W3 Received as W2	MW01	MW03	MW04
Sampling date / time				07-Jul-2021 00:00	07-Jul-2021 00:00	07-Jul-2021 00:00	08-Jul-2021 00:00	08-Jul-2021 00:00	
Compound	CAS Number	LOR	Unit	ES2125613-050	ES2125613-051	ES2125613-052	ES2125613-053	ES2125613-054	
				Result	Result	Result	Result	Result	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20	
[^] C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20	
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
>C16 - C34 Fraction	----	100	µg/L	<100	<100	470	<100	<100	
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
[^] >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	470	<100	<100	
[^] >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100	
EP080: BTEXN									
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1	
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2	
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2	
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2	
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2	
[^] Total Xylenes	----	2	µg/L	<2	<2	<2	<2	<2	
[^] Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1	
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5	
EP074S: VOC Surrogates									
1,2-Dichloroethane-D4	17060-07-0	5	%	116	114	111	114	97.5	
Toluene-D8	2037-26-5	5	%	122	117	111	111	99.3	
4-Bromofluorobenzene	460-00-4	5	%	114	111	106	108	93.0	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%	29.2	29.4	28.6	26.1	26.5	
2-Chlorophenol-D4	93951-73-6	1.0	%	60.3	63.6	49.3	50.5	63.0	
2,4,6-Tribromophenol	118-79-6	1.0	%	61.8	68.8	60.0	47.6	63.7	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%	75.9	82.5	75.4	67.0	88.8	
Anthracene-d10	1719-06-8	1.0	%	76.0	82.7	69.9	66.4	83.1	
4-Terphenyl-d14	1718-51-0	1.0	%	91.4	92.9	79.4	73.2	91.2	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%	115	113	110	113	97.0	
Toluene-D8	2037-26-5	2	%	122	117	111	111	99.3	
4-Bromofluorobenzene	460-00-4	2	%	118	118	113	114	95.2	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW05	MW06	MW07	MW08	MW11
Sampling date / time				08-Jul-2021 00:00	07-Jul-2021 00:00	07-Jul-2021 00:00	07-Jul-2021 00:00	07-Jul-2021 00:00	
Compound	CAS Number	LOR	Unit	ES2125613-055	ES2125613-056	ES2125613-057	ES2125613-058	ES2125613-059	
				Result	Result	Result	Result	Result	
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L	<0.001	0.001	<0.001	<0.001	<0.001	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Chromium	7440-47-3	0.001	mg/L	0.001	<0.001	<0.001	0.003	0.032	
Copper	7440-50-8	0.001	mg/L	0.002	<0.001	<0.001	<0.001	<0.001	
Nickel	7440-02-0	0.001	mg/L	<0.001	0.004	<0.001	<0.001	<0.001	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	0.009	<0.005	
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	5	µg/L	<5	<5	<5	<5	<5	
Isopropylbenzene	98-82-8	5	µg/L	<5	<5	<5	<5	<5	
n-Propylbenzene	103-65-1	5	µg/L	<5	<5	<5	<5	<5	
1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	<5	<5	<5	
sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	<5	<5	<5	
1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	14	<5	<5	<5	
tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	<5	<5	<5	
p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	<5	<5	<5	
n-Butylbenzene	104-51-8	5	µg/L	<5	<5	<5	<5	<5	
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	50	µg/L	<50	<50	<50	<50	<50	
2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	<50	<50	<50	
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	<50	<50	<50	
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	<50	<50	<50	
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	5	µg/L	<5	<5	<5	<5	<5	
EP074D: Fumigants									
2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	<5	<5	<5	
1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	<5	<5	<5	
cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	<5	<5	<5	
trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	<5	<5	<5	
1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	<5	<5	<5	
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	<50	<50	<50	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW05	MW06	MW07	MW08	MW11
Sampling date / time				08-Jul-2021 00:00	07-Jul-2021 00:00	07-Jul-2021 00:00	07-Jul-2021 00:00	07-Jul-2021 00:00	
Compound	CAS Number	LOR	Unit	ES2125613-055	ES2125613-056	ES2125613-057	ES2125613-058	ES2125613-059	
				Result	Result	Result	Result	Result	
EP074F: Halogenated Aromatic Compounds - Continued									
1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	<5	<5	<5	
1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	<5	<5	<5	
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L	<5	<5	<5	<5	<5	
Bromodichloromethane	75-27-4	5	µg/L	<5	<5	<5	<5	<5	
Dibromochloromethane	124-48-1	5	µg/L	<5	<5	<5	<5	<5	
Bromoform	75-25-2	5	µg/L	<5	<5	<5	<5	<5	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L	<1.0	8.8	<1.0	<1.0	<1.0	
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Acenaphthene	83-32-9	1.0	µg/L	<1.0	1.0	<1.0	<1.0	<1.0	
Fluorene	86-73-7	1.0	µg/L	<1.0	2.3	<1.0	<1.0	<1.0	
Phenanthrene	85-01-8	1.0	µg/L	<1.0	1.6	<1.0	<1.0	<1.0	
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	
Indeno(1,2,3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	13.7	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20	
C10 - C14 Fraction	----	50	µg/L	<50	690	<50	<50	<50	
C15 - C28 Fraction	----	100	µg/L	<100	2190	<100	<100	<100	
C29 - C36 Fraction	----	50	µg/L	<50	70	<50	<50	<50	
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	2950	<50	<50	<50	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW05	MW06	MW07	MW08	MW11
Sampling date / time				08-Jul-2021 00:00	07-Jul-2021 00:00	07-Jul-2021 00:00	07-Jul-2021 00:00	07-Jul-2021 00:00	
Compound	CAS Number	LOR	Unit	ES2125613-055	ES2125613-056	ES2125613-057	ES2125613-058	ES2125613-059	
				Result	Result	Result	Result	Result	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20	
>C10 - C16 Fraction	----	100	µg/L	<100	1180	<100	<100	<100	
>C16 - C34 Fraction	----	100	µg/L	<100	1740	<100	<100	<100	
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	2920	<100	<100	<100	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	1160	<100	<100	<100	
EP080: BTEXN									
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1	
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2	
Ethylbenzene	100-41-4	2	µg/L	<2	2	<2	<2	<2	
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2	
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2	
^ Total Xylenes	----	2	µg/L	<2	<2	<2	<2	<2	
^ Sum of BTEX	----	1	µg/L	<1	2	<1	<1	<1	
Naphthalene	91-20-3	5	µg/L	<5	15	<5	<5	<5	
EP074S: VOC Surrogates									
1,2-Dichloroethane-D4	17060-07-0	5	%	115	127	118	115	116	
Toluene-D8	2037-26-5	5	%	114	128	123	118	126	
4-Bromofluorobenzene	460-00-4	5	%	112	118	117	110	119	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%	27.9	24.3	25.7	28.3	28.3	
2-Chlorophenol-D4	93951-73-6	1.0	%	53.6	52.4	60.4	47.3	50.6	
2,4,6-Tribromophenol	118-79-6	1.0	%	53.6	88.0	61.2	47.2	50.9	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%	84.0	68.2	78.7	67.6	73.4	
Anthracene-d10	1719-06-8	1.0	%	78.9	86.3	76.4	68.3	73.3	
4-Terphenyl-d14	1718-51-0	1.0	%	86.4	80.2	84.8	81.5	84.2	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%	114	126	118	114	116	
Toluene-D8	2037-26-5	2	%	114	128	124	118	126	
4-Bromofluorobenzene	460-00-4	2	%	117	122	123	117	127	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Tripblank	Tripspike	MW12	----	----
Sampling date / time				05-Jul-2021 00:00	05-Jul-2021 00:00	07-Jul-2021 00:00	----	----	
Compound	CAS Number	LOR	Unit	ES2125613-060	ES2125613-061	ES2125613-062	-----	-----	
				Result	Result	Result	----	----	
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L	----	----	<0.001	----	----	
Cadmium	7440-43-9	0.0001	mg/L	----	----	<0.0001	----	----	
Chromium	7440-47-3	0.001	mg/L	----	----	0.011	----	----	
Copper	7440-50-8	0.001	mg/L	----	----	<0.001	----	----	
Nickel	7440-02-0	0.001	mg/L	----	----	<0.001	----	----	
Lead	7439-92-1	0.001	mg/L	----	----	<0.001	----	----	
Zinc	7440-66-6	0.005	mg/L	----	----	<0.005	----	----	
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L	----	----	<0.0001	----	----	
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	5	µg/L	----	----	<5	----	----	
Isopropylbenzene	98-82-8	5	µg/L	----	----	<5	----	----	
n-Propylbenzene	103-65-1	5	µg/L	----	----	<5	----	----	
1.3.5-Trimethylbenzene	108-67-8	5	µg/L	----	----	<5	----	----	
sec-Butylbenzene	135-98-8	5	µg/L	----	----	<5	----	----	
1.2.4-Trimethylbenzene	95-63-6	5	µg/L	----	----	<5	----	----	
tert-Butylbenzene	98-06-6	5	µg/L	----	----	<5	----	----	
p-Isopropyltoluene	99-87-6	5	µg/L	----	----	<5	----	----	
n-Butylbenzene	104-51-8	5	µg/L	----	----	<5	----	----	
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	50	µg/L	----	----	<50	----	----	
2-Butanone (MEK)	78-93-3	50	µg/L	----	----	<50	----	----	
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	----	----	<50	----	----	
2-Hexanone (MBK)	591-78-6	50	µg/L	----	----	<50	----	----	
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	5	µg/L	----	----	<5	----	----	
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	5	µg/L	----	----	<5	----	----	
1.2-Dichloropropane	78-87-5	5	µg/L	----	----	<5	----	----	
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	----	----	<5	----	----	
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	----	----	<5	----	----	
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	----	----	<5	----	----	
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	50	µg/L	----	----	<50	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Tripblank	Tripspike	MW12	----	----
Sampling date / time				05-Jul-2021 00:00	05-Jul-2021 00:00	07-Jul-2021 00:00	----	----	
Compound	CAS Number	LOR	Unit	ES2125613-060	ES2125613-061	ES2125613-062	-----	-----	
				Result	Result	Result	----	----	
EP074E: Halogenated Aliphatic Compounds - Continued									
Chloromethane	74-87-3	50	µg/L	----	----	<50	----	----	
Vinyl chloride	75-01-4	50	µg/L	----	----	<50	----	----	
Bromomethane	74-83-9	50	µg/L	----	----	<50	----	----	
Chloroethane	75-00-3	50	µg/L	----	----	<50	----	----	
Trichlorofluoromethane	75-69-4	50	µg/L	----	----	<50	----	----	
1,1-Dichloroethene	75-35-4	5	µg/L	----	----	<5	----	----	
Iodomethane	74-88-4	5	µg/L	----	----	<5	----	----	
trans-1,2-Dichloroethene	156-60-5	5	µg/L	----	----	<5	----	----	
1,1-Dichloroethane	75-34-3	5	µg/L	----	----	<5	----	----	
cis-1,2-Dichloroethene	156-59-2	5	µg/L	----	----	<5	----	----	
1,1,1-Trichloroethane	71-55-6	5	µg/L	----	----	<5	----	----	
1,1-Dichloropropylene	563-58-6	5	µg/L	----	----	<5	----	----	
Carbon Tetrachloride	56-23-5	5	µg/L	----	----	<5	----	----	
1,2-Dichloroethane	107-06-2	5	µg/L	----	----	<5	----	----	
Trichloroethene	79-01-6	5	µg/L	----	----	<5	----	----	
Dibromomethane	74-95-3	5	µg/L	----	----	<5	----	----	
1,1,2-Trichloroethane	79-00-5	5	µg/L	----	----	<5	----	----	
1,3-Dichloropropane	142-28-9	5	µg/L	----	----	<5	----	----	
Tetrachloroethene	127-18-4	5	µg/L	----	----	<5	----	----	
1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	----	----	<5	----	----	
trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	----	----	<5	----	----	
cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	----	----	<5	----	----	
1,1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	----	----	<5	----	----	
1,2,3-Trichloropropane	96-18-4	5	µg/L	----	----	<5	----	----	
Pentachloroethane	76-01-7	5	µg/L	----	----	<5	----	----	
1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	----	----	<5	----	----	
Hexachlorobutadiene	87-68-3	5	µg/L	----	----	<5	----	----	
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	5	µg/L	----	----	<5	----	----	
Bromobenzene	108-86-1	5	µg/L	----	----	<5	----	----	
2-Chlorotoluene	95-49-8	5	µg/L	----	----	<5	----	----	
4-Chlorotoluene	106-43-4	5	µg/L	----	----	<5	----	----	
1,3-Dichlorobenzene	541-73-1	5	µg/L	----	----	<5	----	----	
1,4-Dichlorobenzene	106-46-7	5	µg/L	----	----	<5	----	----	
1,2-Dichlorobenzene	95-50-1	5	µg/L	----	----	<5	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Tripblank	Tripspike	MW12	----	----
Sampling date / time				05-Jul-2021 00:00	05-Jul-2021 00:00	07-Jul-2021 00:00	----	----	
Compound	CAS Number	LOR	Unit	ES2125613-060	ES2125613-061	ES2125613-062	-----	-----	
				Result	Result	Result	----	----	
EP074F: Halogenated Aromatic Compounds - Continued									
1,2,4-Trichlorobenzene	120-82-1	5	µg/L	----	----	<5	----	----	
1,2,3-Trichlorobenzene	87-61-6	5	µg/L	----	----	<5	----	----	
EP074G: Trihalomethanes									
Chloroform	67-66-3	5	µg/L	----	----	<5	----	----	
Bromodichloromethane	75-27-4	5	µg/L	----	----	<5	----	----	
Dibromochloromethane	124-48-1	5	µg/L	----	----	<5	----	----	
Bromoform	75-25-2	5	µg/L	----	----	<5	----	----	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L	----	----	<1.0	----	----	
Acenaphthylene	208-96-8	1.0	µg/L	----	----	<1.0	----	----	
Acenaphthene	83-32-9	1.0	µg/L	----	----	<1.0	----	----	
Fluorene	86-73-7	1.0	µg/L	----	----	<1.0	----	----	
Phenanthrene	85-01-8	1.0	µg/L	----	----	<1.0	----	----	
Anthracene	120-12-7	1.0	µg/L	----	----	<1.0	----	----	
Fluoranthene	206-44-0	1.0	µg/L	----	----	<1.0	----	----	
Pyrene	129-00-0	1.0	µg/L	----	----	<1.0	----	----	
Benzo(a)anthracene	56-55-3	1.0	µg/L	----	----	<1.0	----	----	
Chrysene	218-01-9	1.0	µg/L	----	----	<1.0	----	----	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	----	----	<1.0	----	----	
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	----	----	<1.0	----	----	
Benzo(a)pyrene	50-32-8	0.5	µg/L	----	----	<0.5	----	----	
Indeno(1,2,3.cd)pyrene	193-39-5	1.0	µg/L	----	----	<1.0	----	----	
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	----	----	<1.0	----	----	
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	----	----	<1.0	----	----	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	----	----	<0.5	----	----	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	----	----	<0.5	----	----	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L	<20	----	<20	----	----	
C10 - C14 Fraction	----	50	µg/L	----	----	<50	----	----	
C15 - C28 Fraction	----	100	µg/L	----	----	<100	----	----	
C29 - C36 Fraction	----	50	µg/L	----	----	<50	----	----	
^ C10 - C36 Fraction (sum)	----	50	µg/L	----	----	<50	----	----	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	<20	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Tripblank	Tripspike	MW12	----	----
Sampling date / time				05-Jul-2021 00:00	05-Jul-2021 00:00	07-Jul-2021 00:00	----	----	
Compound	CAS Number	LOR	Unit	ES2125613-060	ES2125613-061	ES2125613-062	-----	-----	
				Result	Result	Result	----	----	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	----	<20	----	----	
>C10 - C16 Fraction	----	100	µg/L	----	----	<100	----	----	
>C16 - C34 Fraction	----	100	µg/L	----	----	<100	----	----	
>C34 - C40 Fraction	----	100	µg/L	----	----	<100	----	----	
^ >C10 - C40 Fraction (sum)	----	100	µg/L	----	----	<100	----	----	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	----	----	<100	----	----	
EP080: BTEXN									
Benzene	71-43-2	1	µg/L	<1	15	<1	----	----	
Toluene	108-88-3	2	µg/L	<2	15	<2	----	----	
Ethylbenzene	100-41-4	2	µg/L	<2	14	<2	----	----	
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	14	<2	----	----	
ortho-Xylene	95-47-6	2	µg/L	<2	15	<2	----	----	
^ Total Xylenes	----	2	µg/L	<2	29	<2	----	----	
^ Sum of BTEX	----	1	µg/L	<1	73	<1	----	----	
Naphthalene	91-20-3	5	µg/L	<5	17	<5	----	----	
EP074S: VOC Surrogates									
1,2-Dichloroethane-D4	17060-07-0	5	%	----	----	116	----	----	
Toluene-D8	2037-26-5	5	%	----	----	122	----	----	
4-Bromofluorobenzene	460-00-4	5	%	----	----	114	----	----	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%	----	----	25.3	----	----	
2-Chlorophenol-D4	93951-73-6	1.0	%	----	----	55.4	----	----	
2,4,6-Tribromophenol	118-79-6	1.0	%	----	----	57.6	----	----	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%	----	----	80.3	----	----	
Anthracene-d10	1719-06-8	1.0	%	----	----	78.8	----	----	
4-Terphenyl-d14	1718-51-0	1.0	%	----	----	87.7	----	----	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%	113	103	116	----	----	
Toluene-D8	2037-26-5	2	%	115	104	122	----	----	
4-Bromofluorobenzene	460-00-4	2	%	116	102	120	----	----	



Analytical Results

Descriptive Results

Sub-Matrix: **SOLID**

Method: Compound	Sample ID - Sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples		
EA200: Description	ACM01 - 06-Jul-2021 00:00	Three pieces of asbestos cement sheeting approximately 40x40x5mm.



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP074S: VOC Surrogates			
1,2-Dichloroethane-D4	17060-07-0	78	133
Toluene-D8	2037-26-5	79	129
4-Bromofluorobenzene	460-00-4	81	124
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2,4,6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

Inter-Laboratory Testing

Analysis conducted by ALS Newcastle, NATA accreditation no. 825, site no. 1656 (Chemistry) 9854 (Biology).

(SOLID) EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples

QUALITY CONTROL REPORT

Work Order	: ES2125613	Page	: 1 of 13
Client	: CAVVANBA CONSULTING	Laboratory	: Environmental Division Sydney
Contact	: MR DREW WOOD	Contact	: Brenda Hong
Address	: PO Box 322 NEWCASTLE 2300	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 6685 7811	Telephone	: +61 2 8784 8555
Project	: 20025.76	Date Samples Received	: 09-Jul-2021
Order number	: 20025.76	Date Analysis Commenced	: 13-Jul-2021
C-O-C number	: ----	Issue Date	: 19-Jul-2021
Sampler	: DREW WOOD, MICHAEL WRIGHT		
Site	: ----		
Quote number	: SY/159/20		
No. of samples received	: 60		
No. of samples analysed	: 42		



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Brendan Schrader	Laboratory Technician	Newcastle - Asbestos, Mayfield West, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)	
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3794949)										
ES2125613-018	TP38 0.0-0.05	EG005T: Lead	7439-92-1	5	mg/kg	18	# 56	104	0% - 50%	
ES2125602-001	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	19	12	50.8	No Limit	
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3794951)										
ES2125613-036	TP44 0.4-0.5	EG005T: Lead	7439-92-1	5	mg/kg	353	331	6.5	0% - 20%	
ES2125660-001	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	333	325	2.5	0% - 20%	
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3794952)										
ES2125613-004	TP33 0.4-0.5	EA055: Moisture Content	----	0.1	%	15.6	15.0	3.3	0% - 20%	
ES2125613-024	TP40 0.0-0.05	EA055: Moisture Content	----	0.1	%	20.2	18.8	7.0	0% - 20%	
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3794953)										
ES2125613-039	TP45 0.2-0.3	EA055: Moisture Content	----	0.1	%	26.3	26.7	1.3	0% - 20%	
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3788092)										
ES2125398-044	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit	
ES2125398-061	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3788092)										
ES2125398-044	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
ES2125398-061	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit	
EP080: BTEXN (QC Lot: 3788092)										
ES2125398-044	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit	



Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)	
EP080: BTEXN (QC Lot: 3788092) - continued										
ES2125398-061	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit	
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit	

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 3790191)									
ES2125603-003	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.010	0.009	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.012	0.013	8.5	No Limit
ES2125304-003	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.006	0.006	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 3790196)									
ES2125613-056	MW06	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.004	0.003	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
ES2125749-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit

EG035F: Dissolved Mercury by FIMS (QC Lot: 3790194)



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG035F: Dissolved Mercury by FIMS (QC Lot: 3790194) - continued									
ES2125304-007	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2125603-002	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 3790197)									
ES2125613-059	MW11	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2125634-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 3787707)									
ES2125613-051	W3 Received as W2	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.0	No Limit
ES2125613-062	MW12	EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.0	No Limit
ES2125613-051	W3 Received as W2	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
ES2125613-062	MW12	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.0	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.0	No Limit
EP074B: Oxygenated Compounds (QC Lot: 3787707)									
EP074C: Sulfonated Compounds (QC Lot: 3787707)									
ES2125613-051	W3 Received as W2	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
ES2125613-062	MW12	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.0	No Limit
EP074D: Fumigants (QC Lot: 3787707)									
ES2125613-051	W3 Received as W2	EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP074D: Fumigants (QC Lot: 3787707) - continued									
ES2125613-051	W3 Received as W2	EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
ES2125613-062	MW12	EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 3787707)									
ES2125613-051	W3 Received as W2	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit		
ES2125613-062	MW12	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP074E: Halogenated Aliphatic Compounds (QC Lot: 3787707) - continued									
ES2125613-062	MW12	EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit		
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit		
EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit		
EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit		
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit		
EP074F: Halogenated Aromatic Compounds (QC Lot: 3787707)									
ES2125613-051	W3 Received as W2	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit
ES2125613-062	MW12	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)	
EP074F: Halogenated Aromatic Compounds (QC Lot: 3787707) - continued										
ES2125613-062	MW12	EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit	
		EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit	
		EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit	
		EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit	
EP074G: Trihalomethanes (QC Lot: 3787707)										
ES2125613-051	W3 Received as W2	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit	
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit	
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit	
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit	
ES2125613-062	MW12	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit	
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit	
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit	
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit	
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3787706)										
ES2125613-051	W3 Received as W2	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit	
ES2125613-062	MW12	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3787706)										
ES2125613-051	W3 Received as W2	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit	
ES2125613-062	MW12	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit	
EP080: BTEXN (QC Lot: 3787706)										
ES2125613-051	W3 Received as W2	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit	
ES2125613-062	MW12	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit	
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit	
			106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit			
	91-20-3	5	µg/L	<5	<5	0.0	No Limit			



Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3794949)									
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	110	82.0	119	
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3794951)									
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	113	82.0	119	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3788092)									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	106	68.4	128	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3788092)									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	109	68.4	128	
EP080: BTEXN (QCLot: 3788092)									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	110	62.0	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	106	67.0	121	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	107	65.0	117	
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	104	66.0	118	
	106-42-3								
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	102	68.0	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	93.3	63.0	119	

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EG020F: Dissolved Metals by ICP-MS (QCLot: 3790191)									
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	91.2	85.0	114	
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	91.8	84.0	110	
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	95.2	85.0	111	
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	91.7	81.0	111	
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	91.4	83.0	111	
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	90.4	82.0	112	
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	89.5	81.0	117	
EG020F: Dissolved Metals by ICP-MS (QCLot: 3790196)									
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	91.1	85.0	114	
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	91.0	84.0	110	
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	92.9	85.0	111	
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	91.3	81.0	111	
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	89.2	83.0	111	
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	86.8	82.0	112	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike	Spike Recovery (%)	Acceptable Limits (%)	
					Concentration	LCS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 3790196) - continued								
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	90.4	81.0	117
EG035F: Dissolved Mercury by FIMS (QCLot: 3790194)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	90.7	83.0	105
EG035F: Dissolved Mercury by FIMS (QCLot: 3790197)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	91.2	83.0	105
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 3787707)								
EP074: Styrene	100-42-5	5	µg/L	<5	10 µg/L	95.5	73.0	119
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	10 µg/L	90.5	76.0	118
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	10 µg/L	88.4	69.0	119
EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	10 µg/L	89.7	74.0	116
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	10 µg/L	89.4	73.0	119
EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	10 µg/L	91.3	74.0	116
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	10 µg/L	89.1	72.0	116
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	10 µg/L	88.9	71.0	119
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	10 µg/L	87.1	65.0	123
EP074B: Oxygenated Compounds (QCLot: 3787707)								
EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	100 µg/L	100	61.4	134
EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	100 µg/L	121	73.6	130
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	100 µg/L	107	66.0	132
EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	100 µg/L	109	65.0	137
EP074C: Sulfonated Compounds (QCLot: 3787707)								
EP074: Carbon disulfide	75-15-0	5	µg/L	<5	10 µg/L	82.4	72.8	127
EP074D: Fumigants (QCLot: 3787707)								
EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	10 µg/L	88.3	68.0	122
EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	10 µg/L	93.9	76.0	118
EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	10 µg/L	94.2	62.0	120
EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	10 µg/L	102	60.0	114
EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	10 µg/L	99.9	69.0	117
EP074E: Halogenated Aliphatic Compounds (QCLot: 3787707)								
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	100 µg/L	87.8	60.6	138
EP074: Chloromethane	74-87-3	50	µg/L	<50	100 µg/L	87.5	67.4	130
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	100 µg/L	82.3	69.4	129
EP074: Bromomethane	74-83-9	50	µg/L	<50	100 µg/L	88.1	56.0	140
EP074: Chloroethane	75-00-3	50	µg/L	<50	100 µg/L	86.3	61.0	139
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	100 µg/L	88.5	69.0	131
EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	10 µg/L	89.2	70.0	124
EP074: Iodomethane	74-88-4	5	µg/L	<5	10 µg/L	99.4	70.2	128
EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	10 µg/L	89.2	74.0	118



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Acceptable Limits (%)	
					Concentration	LCS	Low	High	
EP074E: Halogenated Aliphatic Compounds (QCLot: 3787707) - continued									
EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	10 µg/L	91.9	74.0	120	
EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	10 µg/L	92.9	77.0	119	
EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	10 µg/L	90.7	67.0	119	
EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	10 µg/L	88.6	73.0	119	
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	10 µg/L	88.3	62.0	120	
EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	10 µg/L	100	73.0	123	
EP074: Trichloroethene	79-01-6	5	µg/L	<5	10 µg/L	91.3	76.0	118	
EP074: Dibromomethane	74-95-3	5	µg/L	<5	10 µg/L	99.0	73.0	119	
EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	10 µg/L	103	72.0	126	
EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	10 µg/L	94.8	71.0	129	
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	10 µg/L	91.3	72.0	124	
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	10 µg/L	96.2	66.0	114	
EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	10 µg/L	102	60.0	120	
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	10 µg/L	106	70.6	128	
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	10 µg/L	105	70.0	124	
EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	10 µg/L	108	74.0	126	
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	10 µg/L	90.8	71.8	126	
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	10 µg/L	106	66.4	136	
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	10 µg/L	82.3	58.0	130	
EP074F: Halogenated Aromatic Compounds (QCLot: 3787707)									
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	10 µg/L	92.4	79.0	117	
EP074: Bromobenzene	108-86-1	5	µg/L	<5	10 µg/L	95.5	76.0	116	
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	10 µg/L	89.5	73.0	119	
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	10 µg/L	89.0	73.0	119	
EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	10 µg/L	90.6	75.0	117	
EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	10 µg/L	94.4	74.0	118	
EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	10 µg/L	98.2	75.0	117	
EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	10 µg/L	90.9	61.0	125	
EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	10 µg/L	92.5	67.0	123	
EP074G: Trihalomethanes (QCLot: 3787707)									
EP074: Chloroform	67-66-3	5	µg/L	<5	10 µg/L	92.6	72.0	120	
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	10 µg/L	96.1	64.0	118	
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	10 µg/L	98.6	65.0	115	
EP074: Bromoform	75-25-2	5	µg/L	<5	10 µg/L	100	73.5	126	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3787155)									
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	76.4	50.0	94.0	
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	77.1	63.6	114	
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	72.2	62.2	113	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Acceptable Limits (%)	
					Concentration	LCS	Low	High	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3787155) - continued									
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	71.3	63.9	115	
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	76.6	62.6	116	
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	73.2	64.3	116	
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	71.3	63.6	118	
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	71.1	63.1	118	
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	77.7	64.1	117	
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	81.5	62.5	116	
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	75.8	61.7	119	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	89.5	63.0	115	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	83.8	63.3	117	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	81.3	59.9	118	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	80.8	61.2	117	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	77.6	59.1	118	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3787154)									
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	85.1	55.8	112	
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	89.5	71.6	113	
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	85.5	56.0	121	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3787706)									
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	79.3	75.0	127	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3787154)									
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	84.4	57.9	119	
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	73.7	62.5	110	
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	67.3	61.5	121	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3787706)									
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	81.6	75.0	127	
EP080: BTEXN (QCLot: 3787706)									
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	82.6	70.0	122	
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	85.2	69.0	123	
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	93.1	70.0	120	
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	90.8	69.0	121	
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	93.4	72.0	122	
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	95.7	70.0	120	

Matrix Spike (MS) Report



The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report				
				Spike Concentration	SpikeRecovery(%) MS	Acceptable Limits (%)		
						Low	High	
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3794949)								
ES2125602-001	Anonymous	EG005T: Lead	7439-92-1	250 mg/kg	100	70.0	130	
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3794951)								
ES2125613-036	TP44 0.4-0.5	EG005T: Lead	7439-92-1	250 mg/kg	101	70.0	130	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3788092)								
ES2125398-044	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	97.5	70.0	130	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3788092)								
ES2125398-044	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	98.7	70.0	130	
EP080: BTEXN (QCLot: 3788092)								
ES2125398-044	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	96.0	70.0	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	98.6	70.0	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	98.9	70.0	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	94.0	70.0	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	95.7	70.0	130	
	EP080: Naphthalene	91-20-3	2.5 mg/kg	88.6	70.0	130		

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Acceptable Limits (%)	
						Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 3790191)							
ES2125304-006	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	114	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	118	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	130	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	127	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	129	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	113	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	115	70.0	130
		EG020F: Dissolved Metals by ICP-MS (QCLot: 3790196)					
ES2125613-057	MW07	EG020A-F: Arsenic	7440-38-2	1 mg/L	93.1	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	94.8	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	100	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	104	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	110	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	92.3	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	93.8	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 3790194)							



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report				
				Spike	SpikeRecovery(%)	Acceptable Limits (%)		
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High	
EG035F: Dissolved Mercury by FIMS (QCLot: 3790194) - continued								
ES2125304-004	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	93.1	70.0	130	
EG035F: Dissolved Mercury by FIMS (QCLot: 3790197)								
ES2125613-058	MW08	EG035F: Mercury	7439-97-6	0.01 mg/L	103	70.0	130	
EP074E: Halogenated Aliphatic Compounds (QCLot: 3787707)								
ES2125613-051	W3 Received as W2	EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	99.0	70.0	130	
		EP074: Trichloroethene	79-01-6	25 µg/L	99.0	70.0	130	
EP074F: Halogenated Aromatic Compounds (QCLot: 3787707)								
ES2125613-051	W3 Received as W2	EP074: Chlorobenzene	108-90-7	25 µg/L	103	70.0	130	
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3787706)								
ES2125613-051	W3 Received as W2	EP080: C6 - C9 Fraction	----	325 µg/L	112	70.0	130	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3787706)								
ES2125613-051	W3 Received as W2	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	114	70.0	130	
EP080: BTEXN (QCLot: 3787706)								
ES2125613-051	W3 Received as W2	EP080: Benzene	71-43-2	25 µg/L	90.9	70.0	130	
		EP080: Toluene	108-88-3	25 µg/L	90.9	70.0	130	
		EP080: Ethylbenzene	100-41-4	25 µg/L	98.9	70.0	130	
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	94.0	70.0	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	25 µg/L	96.4	70.0	130	
	EP080: Naphthalene	91-20-3	25 µg/L	99.8	70.0	130		

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2125613	Page	: 1 of 11
Client	: CAVVANBA CONSULTING	Location	: ni Eroi v ei taOmEDoi st Si et
Client Address	: c M m Mn R R W W m	Telephone	: h+1 2 8784 8555
Project	: 20025.7+	Material	: 09-Ju2021
Site	: ----	Due date	: 19-Ju2021
Sample	: m Mn R R W W m, c ly H A n 6 R M I G H T	No. of Data	: +0
Service Level	: 20025.7+	No. of Data	: 42

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief v etpoS Duv v arleDai S refer ei deDare aCb OroESeS to aDDDbli tradeaLIUt .

Summary of Outliers

Outliers : Quality Control Samples

Top Dre Corb plgp tDout tDf aggeS li tpe Quatt y oi broQ (y) Me Corb

- **NO** Method Blank value outliers occur.
- **NO** Laboratory Control outliers occur.
- **NO** Matrix Spike outliers occur.
- Duplicate outliers exist - please see following pages for full details.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers exist - please see following pages for full details.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

c abrl% SOIL

y ov Cbui S GrouONav e	6aLorabrtr sav C@ Im	y Cei bsav C@ Im	Analyte	y As Nuv Ler	meta	6lv lID	Comment
Duplicate (DUP) RPDs							
nG005(nm09V)T: Totac eta@Ll y P-Ans	ns2125+1V-018	TPV8 0.0-0.05	Lead	74V9-92-1	104 3	03 - 503	RPD exceeds LOR based limits

Outliers : Frequency of Quality Control Samples

c abrl% SOIL

Qua@t y oi troCs av C@ Tt C@	y oui b		Mate (3)		Qua@t y oi troCs Cedffidat@i
	Qy	Megu@r	AduaC	n%@edteS	
6aLorabrtr muQ@lateD(mx P)					
c olDure y oi t@i b	V	W	9.09	10.00	NnPc 201V BV & A6s Qy st@i SarS

c abrl% WATER

Qua@t y oi troCs av C@ Tt C@	y oui b		Mate (3)		Qua@t y oi troCs Cedffidat@i
	Qy	Megu@r	AduaC	n%@edteS	
6aLorabrtr muQ@lateD(mx P)					
PAH/Ppei o@ (Gy /c s - s lc)	0	11	0.00	10.00	NnPc 201V BV & A6s Qy st@i SarS
TMH - s ev lEo@t@ Frad@i	0	1V	0.00	10.00	NnPc 201V BV & A6s Qy st@i SarS
c abrl% s QkeD(c s)					
PAH/Ppei o@ (Gy /c s - s lc)	0	11	0.00	5.00	NnPc 201V BV & A6s Qy st@i SarS
TMH - s ev lEo@t@ Frad@i	0	1V	0.00	5.00	NnPc 201V BV & A6s Qy st@i SarS

Analysis Holding Time Compliance

If Dav C@Dare lSei tifleS Le@w adpaBi g Leei ai aC@eS or e%bradteS out@Se of redov v ei SeS po@li g tlv eD lplD@pou@ Le t@kei li t@ doi DSerat@i wpei li t@rOre@i g reD@D. TplD reC@rb Duv v arlzeD e%brad@i / CreQarat@i ai S ai aC@D tlv eD ai S dov CareD eadp wlt@ A6s redov v ei SeS po@li g tlv eD (referei dli g x snPA sR 84+, APHA, As ai S NnPc) LaDeS oi tpe Dav C@ doi t@li er OroESeS. mateDreC@rteS reCreDei bfrDbSate of e%brad@i or ai aC@D ai S Cred@Se DuLDequei bS@t@i Dai S rerui D. A @@i g of LreadpeD (If ai t) lDroESeS pereli . Ho@li g tlv e for @adpate v elpoSD (e.g. Ty6P) Eart addorSli g t@ tpe ai aC@eD reC@rteS. ADDeDv ei b dov CareD tpe @adp Sate wlt@ tpe Dport@b ai aC@e po@li g tlv e for tpe equle@@i b DoIC v elpoS. TpeDe are: orgai l@D 14 Sat D, v erdurt 28 Sat D & olper v eta@180 Sat D. A redorSeS Lreadp SoeDi obguarai t@e a Lreadp for aC@ oi -Eo@t@ Carav et@rD. Ho@li g tlv eD for VOC in soils Eart addorSli g t@ ai aC@eD of li t@reD@ Uli tCy p@rliSe ai S st@rei e po@li g tlv e lD 7 Sat D, olperD 14 Sat D. A redorSeS Lreadp SoeDi ob guarai t@e a Lreadp for aC@UWY ai aC@eD ai S Dpou@ Le EerifleS li daDe tpe reC@rteS Lreadp lDa faC@e CoD@Ee or Uli tCy p@rliSe ai S st@rei e are i obket ai aC@eD of li t@reD@i deri .

c abrl% SOIL

nEaQat@i : * = Ho@li g tlv e Lreadp ; ✓ = R l@pli po@li g tlv e.

Method	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
Container / Client Sample ID(s)							



Method: SOIL nEaQaboi : * = HoSi g tV e Lreadp ; ✓ = R lpli poSi g tV e.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA055: Moisture Content (Dried @ 105-110°C)								
Soil Glass Jar - Unpreserved (EA055) TPW 0.0-0.05, TPV4 0.0-0.05, TPV5 0.0-0.05, TPV+ 0.0-0.05, Qs01, Qs05	TPW 0.4-0.5, TPV4 0.4-0.5, TPV5 0.4-0.5, TPV+ 0.9-1.0, Qs0V,	06-Jul-2021	----	----	----	15-Jul-2021	20-Jul-2021	✓
Soil Glass Jar - Unpreserved (EA055) TPV7 0.0-0.05, TPV9 0.0-0.05, TP40 0.0-0.05, TP42 0.0-0.05, TP4V 0.0-0.05, TP44 0.0-0.05, TP45 0.0-0.05,	TPV8 0.0-0.05, TPV9 0.V-0.4, TP41 0.0-0.05, TP42 0.4-0.5, TP4V 0.9-1.0, TP44 0.4-0.5, TP45 0.2-0.V	07-Jul-2021	----	----	----	15-Jul-2021	21-Jul-2021	✓
EG005(ED093)T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T) TPW 0.0-0.05, TPV4 0.0-0.05, TPV5 0.0-0.05, TPV+ 0.0-0.05, Qs01, Qs05	TPW 0.4-0.5, TPV4 0.4-0.5, TPV5 0.4-0.5, TPV+ 0.9-1.0, Qs0V,	06-Jul-2021	15-Jul-2021	02-Jai -2022	✓	16-Jul-2021	02-Jai -2022	✓
Soil Glass Jar - Unpreserved (EG005T) TPV7 0.0-0.05, TPV9 0.0-0.05, TP40 0.0-0.05, TP42 0.0-0.05, TP4V 0.0-0.05, TP44 0.0-0.05, TP45 0.0-0.05,	TPV8 0.0-0.05, TPV9 0.V-0.4, TP41 0.0-0.05, TP42 0.4-0.5, TP4V 0.9-1.0, TP44 0.4-0.5, TP45 0.2-0.V	07-Jul-2021	15-Jul-2021	0V-Jai -2022	✓	16-Jul-2021	0V-Jai -2022	✓
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP080) TriCl@i k		08-Jul-2021	13-Jul-2021	22-Jul-2021	✓	15-Jul-2021	22-Jul-2021	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Soil Glass Jar - Unpreserved (EP080) TriCl@i k		08-Jul-2021	13-Jul-2021	22-Jul-2021	✓	15-Jul-2021	22-Jul-2021	✓
EP080: BTEXN								
Soil Glass Jar - Unpreserved (EP080) TriOQke,	TriOs Qke y oi broC	05-Jul-2021	13-Jul-2021	19-Jul-2021	✓	15-Jul-2021	19-Jul-2021	✓
Soil Glass Jar - Unpreserved (EP080) TriCl@i k		08-Jul-2021	13-Jul-2021	22-Jul-2021	✓	15-Jul-2021	22-Jul-2021	✓



c abt% SOLID n EaQaboi : * = HoSli g tlv e Lreadp ; ✓ = R ltpi poSli g tlv e.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples							
Snap Lock Bag - ACM/Asbestos Grab Bag (EA200) Ayc 01	06-Jul-2021	----	----	----	13-Jul-2021	02-Jai -2022	✓

c abt% WATER n EaQaboi : * = HoSli g tlv e Lreadp ; ✓ = R ltpi poSli g tlv e.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) R 1, c R 01, c R 07, c R 11, R V - MedelEeS aDR 2, c R 0+, c R 08, c R 12	07-Jul-2021	----	----	----	14-Jul-2021	0V-Jai -2022	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) c R 0V, c R 05 c R 04,	08-Jul-2021	----	----	----	14-Jul-2021	04-Jai -2022	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) R 1, c R 01, c R 07, c R 11, R V - MedelEeS aDR 2, c R 0+, c R 08, c R 12	07-Jul-2021	----	----	----	15-Jul-2021	04-Aug-2021	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) c R 0V, c R 05 c R 04,	08-Jul-2021	----	----	----	15-Jul-2021	05-Aug-2021	✓
EP074A: Monocyclic Aromatic Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP074) R 1, c R 01, c R 07, c R 11, R V - MedelEeS aDR 2, c R 0+, c R 08, c R 12	07-Jul-2021	15-Jul-2021	21-JuG2021	✓	15-Jul-2021	21-JuG2021	✓
Amber VOC Vial - Sulfuric Acid (EP074) c R 0V, c R 05 c R 04,	08-Jul-2021	15-Jul-2021	22-JuG2021	✓	15-Jul-2021	22-JuG2021	✓
EP074B: Oxygenated Compounds							
Amber VOC Vial - Sulfuric Acid (EP074) R 1, c R 01, c R 07, c R 11, R V - MedelEeS aDR 2, c R 0+, c R 08, c R 12	07-Jul-2021	15-Jul-2021	21-JuG2021	✓	15-Jul-2021	21-JuG2021	✓
Amber VOC Vial - Sulfuric Acid (EP074) c R 0V, c R 05 c R 04,	08-Jul-2021	15-Jul-2021	22-JuG2021	✓	15-Jul-2021	22-JuG2021	✓



c abt% WATER n EaQaboi : * = HoSi g tlv e Lreadp ; ✓ = R ltpi poSi g tlv e.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EP074C: Sulfonated Compounds								
Amber VOC Vial - Sulfuric Acid (EP074) R 1, c R 01, c R 07, c R 11,	R V - MedelEeS aDR 2, c R 0+, c R 08, c R 12	07-Jul-2021	15-Jul-2021	21-Jul-2021	✓	15-Jul-2021	21-Jul-2021	✓
Amber VOC Vial - Sulfuric Acid (EP074) c R 0V, c R 05	c R 04,	08-Jul-2021	15-Jul-2021	22-Jul-2021	✓	15-Jul-2021	22-Jul-2021	✓
EP074D: Fumigants								
Amber VOC Vial - Sulfuric Acid (EP074) R 1, c R 01, c R 07, c R 11,	R V - MedelEeS aDR 2, c R 0+, c R 08, c R 12	07-Jul-2021	15-Jul-2021	21-Jul-2021	✓	15-Jul-2021	21-Jul-2021	✓
Amber VOC Vial - Sulfuric Acid (EP074) c R 0V, c R 05	c R 04,	08-Jul-2021	15-Jul-2021	22-Jul-2021	✓	15-Jul-2021	22-Jul-2021	✓
EP074E: Halogenated Aliphatic Compounds								
Amber VOC Vial - Sulfuric Acid (EP074) R 1, c R 01, c R 07, c R 11,	R V - MedelEeS aDR 2, c R 0+, c R 08, c R 12	07-Jul-2021	15-Jul-2021	21-Jul-2021	✓	15-Jul-2021	21-Jul-2021	✓
Amber VOC Vial - Sulfuric Acid (EP074) c R 0V, c R 05	c R 04,	08-Jul-2021	15-Jul-2021	22-Jul-2021	✓	15-Jul-2021	22-Jul-2021	✓
EP074F: Halogenated Aromatic Compounds								
Amber VOC Vial - Sulfuric Acid (EP074) R 1, c R 01, c R 07, c R 11,	R V - MedelEeS aDR 2, c R 0+, c R 08, c R 12	07-Jul-2021	15-Jul-2021	21-Jul-2021	✓	15-Jul-2021	21-Jul-2021	✓
Amber VOC Vial - Sulfuric Acid (EP074) c R 0V, c R 05	c R 04,	08-Jul-2021	15-Jul-2021	22-Jul-2021	✓	15-Jul-2021	22-Jul-2021	✓



Method WATER nEaQaboi : * = HoSi g tlv e Lreadp ; ✓ = R ltpi poSi g tlv e.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EP074G: Trihalomethanes								
Amber VOC Vial - Sulfuric Acid (EP074) R 1, c R 01, c R 07, c R 11,	R V - MedelEeS aDR 2, c R 0+, c R 08, c R 12	07-Jul-2021	15-Jul-2021	21-Jul-2021	✓	15-Jul-2021	21-Jul-2021	✓
Amber VOC Vial - Sulfuric Acid (EP074) c R 0V, c R 05	c R 04,	08-Jul-2021	15-Jul-2021	22-Jul-2021	✓	15-Jul-2021	22-Jul-2021	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Amber Glass Bottle - Unpreserved (EP075(SIM)) R 1, c R 01, c R 07, c R 11,	R V - MedelEeS aDR 2, c R 0+, c R 08, c R 12	07-Jul-2021	13-Jul-2021	14-Jul-2021	✓	16-Jul-2021	22-Aug-2021	✓
Amber Glass Bottle - Unpreserved (EP075(SIM)) c R 0V, c R 05	c R 04,	08-Jul-2021	13-Jul-2021	15-Jul-2021	✓	16-Jul-2021	22-Aug-2021	✓
EP080/071: Total Petroleum Hydrocarbons								
Amber Glass Bottle - Unpreserved (EP071) R 1, c R 01, c R 07, c R 11,	R V - MedelEeS aDR 2, c R 0+, c R 08, c R 12	07-Jul-2021	13-Jul-2021	14-Jul-2021	✓	16-Jul-2021	22-Aug-2021	✓
Amber Glass Bottle - Unpreserved (EP071) c R 0V, c R 05	c R 04,	08-Jul-2021	13-Jul-2021	15-Jul-2021	✓	16-Jul-2021	22-Aug-2021	✓
Amber VOC Vial - Sulfuric Acid (EP080) TriChl k		05-Jul-2021	15-Jul-2021	19-Jul-2021	✓	15-Jul-2021	19-Jul-2021	✓
Amber VOC Vial - Sulfuric Acid (EP080) R 1, c R 01, c R 07, c R 11,	R V - MedelEeS aDR 2, c R 0+, c R 08, c R 12	07-Jul-2021	15-Jul-2021	21-Jul-2021	✓	15-Jul-2021	21-Jul-2021	✓
Amber VOC Vial - Sulfuric Acid (EP080) c R 0V, c R 05	c R 04,	08-Jul-2021	15-Jul-2021	22-Jul-2021	✓	15-Jul-2021	22-Jul-2021	✓



Method: WATER
 nEaQaboi : * = HoSi g tV e Lreadp ; ✓ = R lpli poSi g tV e.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Amber Glass Bottle - Unpreserved (EP071) R 1, c R 01, c R 07, c R 11,	R V - MedelEeS aDR 2, c R 0+, c R 08, c R 12	07-Jul-2021	13-Jul-2021	14-Jul-2021	✓	16-Jul-2021	22-Aug-2021	✓
Amber Glass Bottle - Unpreserved (EP071) c R 0V, c R 05	c R 04,	08-Jul-2021	13-Jul-2021	15-Jul-2021	✓	16-Jul-2021	22-Aug-2021	✓
Amber VOC Vial - Sulfuric Acid (EP080) TriQ @i k		05-Jul-2021	15-Jul-2021	19-Jul-2021	✓	15-Jul-2021	19-Jul-2021	✓
Amber VOC Vial - Sulfuric Acid (EP080) R 1, c R 01, c R 07, c R 11,	R V - MedelEeS aDR 2, c R 0+, c R 08, c R 12	07-Jul-2021	15-Jul-2021	21-Jul-2021	✓	15-Jul-2021	21-Jul-2021	✓
Amber VOC Vial - Sulfuric Acid (EP080) c R 0V, c R 05	c R 04,	08-Jul-2021	15-Jul-2021	22-Jul-2021	✓	15-Jul-2021	22-Jul-2021	✓
EP080: BTEXN								
Amber VOC Vial - Sulfuric Acid (EP080) TriQ @i k,	TriQ @i k	05-Jul-2021	15-Jul-2021	19-Jul-2021	✓	15-Jul-2021	19-Jul-2021	✓
Amber VOC Vial - Sulfuric Acid (EP080) R 1, c R 01, c R 07, c R 11,	R V - MedelEeS aDR 2, c R 0+, c R 08, c R 12	07-Jul-2021	15-Jul-2021	21-Jul-2021	✓	15-Jul-2021	21-Jul-2021	✓
Amber VOC Vial - Sulfuric Acid (EP080) c R 0V, c R 05	c R 04,	08-Jul-2021	15-Jul-2021	22-Jul-2021	✓	15-Jul-2021	22-Jul-2021	✓



Quality Control Parameter Frequency Compliance

The following table provides a summary of the frequency of compliance for the Quality Control Parameters (QCPs) listed in the table. The table is organized by parameter type (e.g., Soil, Water) and then by parameter name. The 'Count' column shows the number of samples that were compliant (Actual) and the number that were non-compliant (Expected). The 'Rate (%)' column shows the percentage of samples that were compliant. The 'Evaluation' column shows the compliance status (Pass/Fail). The 'Quality Control Specification' column provides the details of the specification for each parameter.

Compliance Status: * = Quality of frequency of compliance is below the specified level; ✓ = Quality of frequency of compliance is within the specified level.

Analytical Methods	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
6aLorabrt muCibateD(mx P)							
Concentration of lead	nA055	V	W	9.09	10.00	*	NnPc 201VBV & A6s Qy s bai SarS
Total lead in P-Ans	nG005T	4	W	12.12	10.00	✓	NnPc 201VBV & A6s Qy s bai SarS
TMH Uo@B@DBTnX	nP080	2	18	11.11	10.00	✓	NnPc 201VBV & A6s Qy s bai SarS
6aLorabrt y oi broCs av O@D(6y s)							
Total lead in P-Ans	nG005T	2	W	6.06	5.00	✓	NnPc 201VBV & A6s Qy s bai SarS
TMH Uo@B@DBTnX	nP080	1	18	5.56	5.00	✓	NnPc 201VBV & A6s Qy s bai SarS
c etpoSB@i kD(c B)							
Total lead in P-Ans	nG005T	2	W	6.06	5.00	✓	NnPc 201VBV & A6s Qy s bai SarS
TMH Uo@B@DBTnX	nP080	1	18	5.56	5.00	✓	NnPc 201VBV & A6s Qy s bai SarS
c abrl@s QkeD(c s)							
Total lead in P-Ans	nG005T	2	W	6.06	5.00	✓	NnPc 201VBV & A6s Qy s bai SarS
TMH Uo@B@DBTnX	nP080	1	18	5.56	5.00	✓	NnPc 201VBV & A6s Qy s bai SarS

Compliance Status: * = Quality of frequency of compliance is below the specified level; ✓ = Quality of frequency of compliance is within the specified level.

Analytical Methods	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
6aLorabrt muCibateD(mx P)							
Mercury in erdurt Lt Flic s	nG0V5F	4	V0	13.33	10.00	✓	NnPc 201VBV & A6s Qy s bai SarS
Mercury in erdurt Lt ly P-c s - sulte A	nG020A-F	4	V0	13.33	10.00	✓	NnPc 201VBV & A6s Qy s bai SarS
PAH/Ppei oD(Gy/c s - slc)	nP075(slc)	0	11	0.00	10.00	*	NnPc 201VBV & A6s Qy s bai SarS
TMH - sev Ie@B@ Fradboi	nP071	0	1V	0.00	10.00	*	NnPc 201VBV & A6s Qy s bai SarS
TMH Uo@B@DBTnX	nP080	2	1V	15.38	10.00	✓	NnPc 201VBV & A6s Qy s bai SarS
Uo@B@ Wrgai Id y ov Obui SD	nP074	2	1V	15.38	10.00	✓	NnPc 201VBV & A6s Qy s bai SarS
6aLorabrt y oi broCs av O@D(6y s)							
Mercury in erdurt Lt Flic s	nG0V5F	2	V0	6.67	5.00	✓	NnPc 201VBV & A6s Qy s bai SarS
Mercury in erdurt Lt ly P-c s - sulte A	nG020A-F	2	V0	6.67	5.00	✓	NnPc 201VBV & A6s Qy s bai SarS
PAH/Ppei oD(Gy/c s - slc)	nP075(slc)	1	11	9.09	5.00	✓	NnPc 201VBV & A6s Qy s bai SarS
TMH - sev Ie@B@ Fradboi	nP071	1	1V	7.69	5.00	✓	NnPc 201VBV & A6s Qy s bai SarS
TMH Uo@B@DBTnX	nP080	1	1V	7.69	5.00	✓	NnPc 201VBV & A6s Qy s bai SarS
Uo@B@ Wrgai Id y ov Obui SD	nP074	1	1V	7.69	5.00	✓	NnPc 201VBV & A6s Qy s bai SarS
c etpoSB@i kD(c B)							
Mercury in erdurt Lt Flic s	nG0V5F	2	V0	6.67	5.00	✓	NnPc 201VBV & A6s Qy s bai SarS
Mercury in erdurt Lt ly P-c s - sulte A	nG020A-F	2	V0	6.67	5.00	✓	NnPc 201VBV & A6s Qy s bai SarS
PAH/Ppei oD(Gy/c s - slc)	nP075(slc)	1	11	9.09	5.00	✓	NnPc 201VBV & A6s Qy s bai SarS
TMH - sev Ie@B@ Fradboi	nP071	1	1V	7.69	5.00	✓	NnPc 201VBV & A6s Qy s bai SarS
TMH Uo@B@DBTnX	nP080	1	1V	7.69	5.00	✓	NnPc 201VBV & A6s Qy s bai SarS



Water

nEaQa@oi : * = Qua@t y oi broCfrequei dt i obwltpli DCedlfdat@oi ; ✓ = Qua@t y oi broCfrequei dt wltpli DCedlfdat@oi .

Qua@t y oi broCsav Q@ Tt Qe Analytical Methods	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
c etpoSB@i kD(c B) - y oi t@i ueS							
Uo@t@ Wrgai Id y ov Qoui SD	nP074	1	1V	7.69	5.00	✓	NnPc 201VBV & A6s Qy s t@i SarS
c abrl@s CkeD(c s)							
mDDo@eSc erdurt Lt Fic s	nG0V5F	2	V0	6.67	5.00	✓	NnPc 201VBV & A6s Qy s t@i SarS
mDDo@eSc et@DLt ly P-c s - sult@ A	nG020A-F	2	V0	6.67	5.00	✓	NnPc 201VBV & A6s Qy s t@i SarS
PAH/Ppei o@ (Gy/c s - slc)	nP075(slc)	0	11	0.00	5.00	✗	NnPc 201VBV & A6s Qy s t@i SarS
TMH - sev lEo@t@ Frad@oi	nP071	0	1V	0.00	5.00	✗	NnPc 201VBV & A6s Qy s t@i SarS
TMH Uo@t@DBTnX	nP080	1	1V	7.69	5.00	✓	NnPc 201VBV & A6s Qy s t@i SarS
Uo@t@ Wrgai Id y ov Qoui SD	nP074	1	1V	7.69	5.00	✓	NnPc 201VBV & A6s Qy s t@i SarS



Brief Method Summaries

Tpe ai aCttdaCOrdeSureDuDeS Lt tpe ni Eroi v ei taOmEldoi paEe Leei SeEeOCeS frov eDtaLCPeS li tpe ai aC redogi lzeS OrdeSureDDurp aDtpoDe QuLCPeS Lt tpe x s nPA, APHA, As ai S NnPC . li pouDe SeEeOCeS OrdeSureDare ev Oot eS li tpe aLDai de of Soduv ei tpe S Dta SarSDor Lt dDei brequeDb Tpe foCwli g reOrbCroBSeDLref SeDtrICtoi Dof tpe ai aCttdaCOrdeSureDev Oot eS for reDucReCorteS li tpe yertifdate of Ai aCDD s ourdeDfrov wpldp A6s v etpoSDpaEe Leei SeEeOCeS are CroESeS wlpai tpe c etpoS meDtrICtoi D

Analytical Methods	Method	Matrix	Method Descriptions
c oildure yoi tpe b	nA055	sVM6	li pouDe: A graEv etrid OrdeSure LaDeS oi welgpbOCDoEer a 12 pour Srt li g CerloS ab105-110 SegreeDy . TplDv etpoSIDdov Ota bwltp NnPC s dpeSu@ B(V).
TotaC ebaDLt ly P-Ans	nG005T	sVM6	li pouDe: Meferei deS to APHA V120; x snPA sR 84+ - +010. c etare Seterv li eS foCwli g ai aC CroOrate adlS SigeDdoi of tpe DbiC Tpe ly PAns tpedi lque loi lDeDDav OeDli a OaDv a, ev ltti g a dparadterlDd Dcedtruv LaDeS oi v etare CreDei b li tpe DbeDabDe@dtteS waEe@i gtpDare dov CareS agali DtpoDe of v abt% v attpes Dta SarSD. TplDv etpoSIDdov Ota bwltp NnPC s dpeSu@ B(V)
TMH Uo@b@D@BTnX	nP080	sVM6	li pouDe: Meferei deS to x snPA sR 84+ - 82+0. n%radDare ai aCDeS Lt Purge ai S TraQ y aOCart Gy/c s . Quai tffidatboi IDLt dov CarlDoi agali Dba eDtaLCPeS 5 Coli bdaQLratboi durEe. y ov Ota bwltp NnPC s dpeSu@ B(V) av ei SeS.
ADLeD@DISEi tffidatboi li Bu@so@SD	nA200	sW6lm	li pouDe: Meferei deS to As 49+4 c etpoS for tpe quaC@tEe lSei tffidatboi of aDLeD@Dli Lu@ Dav OeD Ai aCDD Lt Po@rLDeS 6lgpbc ldroDdoQ li d@Sli g SID@rDoi Dta li g
mIDb@eSc ebaDLt ly P-c s - sulte A	nG020A-F	RATnM	li pouDe: Meferei deS to APHA V125; x snPA sR 84+ - +020, A6s QR I-nN/nG020. sav OeDare 0.45µv fl@ereS Oror to ai aCDD Tpe ly Pc s tpedi lque ut@zeDa plgpc effldei bargoi OaDv a to loi lze De@dtteS e@v ei tD loi D are tpei CaDDeS li to a plgp Eaduv v aDDDcedtruv ete, wpldp DeCarateD tpe ai aC tEDLaDeS oi tpe lS IDdi db v aDDto dparge rabDOror to tpe l v eadurev ei bLT a SIDre@ St i oSe loi Seted@r.
mIDb@eSc erdurt Lt Flc s	nG0V5F	RATnM	li pouDe: Meferei deS to As V550, APHA V112 Hg - B (F@w-li jedtboi (s i y @)(y o@ Ua@our gei eratboi) AAs) sav OeDare 0.45µv fl@ereS Oror to ai aCDD Flc -AAs IDai aut@v at@S f@v e@DDat@v ld aLDrC@oi tpedi lque. A Lrov at@/Lrov lSe reagei bIDuDeS to o%SIDe ai t orgai ld v erdurt dov Obui SDli tpe fl@ereS Dav Oe. Tpe loi ld v erdurt lDreSudeS oi @ e to at@v ld v erdurt Ea@our Lt si y @ wpldp lD tpei CurgeS li to a peateS quartz de@ Quai tffidatboi IDLt dov Carl g aLDrLai de agali Dba daQLratboi durEe. TplDv etpoSIDdov Ota bwltp NnPC s dpeSu@ B(V).
TMH - sev lEo@b@ FradDoi	nP071	RATnM	li pouDe: Meferei deS to x snPA sR 84+ - 8015 Tpe Dav Oe e%radDliDai aCDeS Lt y aOCart Gy/FIm ai S quai tffidatboi IDLt dov CarlDoi agali Dba eDtaLCPeS 5 Coli bdaQLratboi durEe of i -A@ai e Dta SarSD. TplD v etpoSIDdov Ota bwltp tpe Qy requlev ei tD of NnPC s dpeSu@ B(V)
Uo@b@ Wrgai ldy ov Obui SD	nP074	RATnM	li pouDe: Meferei deS to x snPA sR 84+ - 82+0 R at@r Dav OeDare Slredt@ CurgeS Oror to ai aCDDLt y aOCart Gy/c s ai S quai tffidatboi IDLt dov CarlDoi agali Dba eDtaLCPeS 5 Coli bdaQLratboi durEe. TplDv etpoSID dov Ota bwltp NnPC s dpeSu@ B(V)
PAH/Ppei o@ (Gy/c s - slc)	nP075(slc)	RATnM	li pouDe: Meferei deS to x snPA sR 84+ - 8270 sav Oe e%radDare ai aCDeS Lt y aOCart Gy/c s li slc c oSe ai S quai tffidatboi IDLt dov CarlDoi agali Dba eDtaLCPeS 5 Coli bdaQLratboi durEe. TplDv etpoSIDdov Ota b wlp NnPC s dpeSu@ B(V)
TMH Uo@b@D@BTnX	nP080	RATnM	li pouDe: Meferei deS to x snPA sR 84+ - 82+0 R at@r Dav OeDare Slredt@ CurgeS Oror to ai aCDDLt y aOCart Gy/c s ai S quai tffidatboi IDLt dov CarlDoi agali Dba eDtaLCPeS 5 Coli bdaQLratboi durEe. A@eri at@Ee@, a Dav Oe lDequL@rateS li a peaSD@ade Ea@ai S a Ortboi of tpe peaSD@ade Seterv li eS Lt Gy c s ai aCDD. TplD v etpoSIDdov Ota bwltp tpe Qy requlev ei tD of NnPC s dpeSu@ B(V)
Preparation Methods	Method	Matrix	Method Descriptions



Preparation Methods	Method	Matrix	Method Descriptions
HobB@dk mlgeDbfor v eta@li D@l@ DeSiv ei tDai S D@SgeD	nN+9	s VM6	li pouDe: Meferei deS to x snPA 200.2. HobB@dk AdlS mlgeD@oi 1.0g of Dav @@ IDpeateS wlt@ Nlt@id ai S Ht Srod@rld adlSD, tpei doo@S. Pero%Se IDaSSeS ai S Dav @@DpeateS ai S doo@S agali Lefore Leli g fl@ereS ai S Lu@eS to EoQv e for ai a@DD. mlgeDbIDaC@roQrlate for Seterv li a@oi of De@cteS v eta@li D@Sge, DeSiv ei tD, ai S D@l@. TplDv etpoSIDdov @ai bwltp NnPc s dpeSu@ B(V).
c etpai o@ n%tradb@oi of sol@for Purge ai STraO	WMG1+	s VM6	li pouDe: Meferei deS to x snPA sR 84+ - 50V0A. 5g of D@S IDDpakei wlt@ Durrogate ai S 10v 6 v etpai oC@lor to ai a@DDLt Purge ai STraO- Gy/c s.
seCarab@rt Fui i e@n%tradb@oi of lqlulSD	WMG14	R ATnM	li pouDe: Meferei deS to x snPA sR 84+ - V510 100 v 6 to 16 of Dav @@ IDbrai DferreS to a DeCarab@rt fui i eC ai S Derla@ e%tradb@S tpre@ tv eDuDi g my c for eadp e%tradb@ Tpe reDu@ai be%tradb@are dov Lli eS, Sept SrateS ai S doi dei brateS for ai a@DD. TplDv etpoSIDdov @ai bwltp NnPc s dpeSu@ B(V) . A6s Sefau@e%l@SeD DeSiv ei bwpldp v at Le reDSei bli tpe doi t@li er.
Uo@t@DR ater PreCarab@oi	WMG1+-R	R ATnM	A 5 v 6 a@quobor 5 v 6 of a S@t@eS Dav @@ IDaSSeS to a 40 v 6 UWy EaC@r Curgli g.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2125613**

Client	: CAVVANBA CONSULTING	Laboratory	: Environmental Division Sydney
Contact	: MR DREW WOOD	Contact	: Brenda Hong
Address	: PO Box 322 NEWCASTLE 2300	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: drew@cavvanba.com	E-mail	: Brenda.Hong@ALSGlobal.com
Telephone	: +61 02 6685 7811	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 6685 5083	Facsimile	: +61-2-8784 8500
Project	: 20025.76	Page	: 1 of 5
Order number	: 20025.76	Quote number	: ES2020CAVCON0008 (SY/159/20)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: DREW WOOD, MICHAEL WRIGHT		

Dates

Date Samples Received	: 09-Jul-2021 13:37	Issue Date	: 12-Jul-2021
Client Requested Due Date	: 19-Jul-2021	Scheduled Reporting Date	: 19-Jul-2021

Delivery Details

Mode of Delivery	: Undefined	Security Seal	: Not Available
No. of coolers/boxes	: ----	Temperature	: -2.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 60 / 41

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **This workorder has been split from ES2125612 and ES2125433.**
- **Samples QS02, QS04, QS06 and QW02 have been forwarded to Eurofins.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP080 BTEXN	SOIL - S-18 (NO MOIST) TRH(C6-C9)/BTEXN with No Moisture for TBs
ES2125613-001	06-Jul-2021 00:00	TP32 0.4-0.5	✓				
ES2125613-002	06-Jul-2021 00:00	TP32 0.9-1.0	✓				
ES2125613-003	06-Jul-2021 00:00	TP33 0.0-0.05		✓	✓		
ES2125613-004	06-Jul-2021 00:00	TP33 0.4-0.5		✓	✓		
ES2125613-005	06-Jul-2021 00:00	TP33 0.9-1.0	✓				
ES2125613-006	06-Jul-2021 00:00	TP34 0.0-0.05		✓	✓		
ES2125613-007	06-Jul-2021 00:00	TP34 0.4-0.5		✓	✓		
ES2125613-008	06-Jul-2021 00:00	TP34 1.9-2.0	✓				
ES2125613-009	06-Jul-2021 00:00	TP35 0.0-0.05		✓	✓		
ES2125613-010	06-Jul-2021 00:00	TP35 0.4-0.5		✓	✓		
ES2125613-011	06-Jul-2021 00:00	TP35 2.4-2.5	✓				
ES2125613-012	06-Jul-2021 00:00	TP36 0.0-0.05		✓	✓		
ES2125613-013	06-Jul-2021 00:00	TP36 0.9-1.0		✓	✓		
ES2125613-014	06-Jul-2021 00:00	TP36 2.4-2.5	✓				
ES2125613-015	07-Jul-2021 00:00	TP37 0.0-0.05		✓	✓		
ES2125613-016	07-Jul-2021 00:00	TP37 0.4-0.5	✓				
ES2125613-017	07-Jul-2021 00:00	TP370.9-1.0	✓				
ES2125613-018	07-Jul-2021 00:00	TP38 0.0-0.05		✓	✓		
ES2125613-019	07-Jul-2021 00:00	TP38 0.4-0.5	✓				
ES2125613-020	07-Jul-2021 00:00	TP38 0.9-1.0	✓				
ES2125613-021	07-Jul-2021 00:00	TP39 0.0-0.05		✓	✓		
ES2125613-022	07-Jul-2021 00:00	TP39 0.3-0.4		✓	✓		
ES2125613-023	07-Jul-2021 00:00	TP39 0.9-1.0	✓				
ES2125613-024	07-Jul-2021 00:00	TP40 0.0-0.05		✓	✓		
ES2125613-025	07-Jul-2021 00:00	TP40 0.4-0.5	✓				
ES2125613-026	07-Jul-2021 00:00	TP40 0.9-1.0	✓				
ES2125613-027	07-Jul-2021 00:00	TP41 0.0-0.05		✓	✓		
ES2125613-028	07-Jul-2021 00:00	TP41 0.4-0.5	✓				
ES2125613-029	07-Jul-2021 00:00	TP42 0.0-0.05		✓	✓		
ES2125613-030	07-Jul-2021 00:00	TP42 0.4-0.5		✓	✓		
ES2125613-031	07-Jul-2021 00:00	TP42 0.6-0.7	✓				
ES2125613-032	07-Jul-2021 00:00	TP43 0.0-0.05		✓	✓		
ES2125613-033	07-Jul-2021 00:00	TP43 0.4-0.5	✓				
ES2125613-034	07-Jul-2021 00:00	TP43 0.9-1.0		✓	✓		
ES2125613-035	07-Jul-2021 00:00	TP44 0.0-0.05		✓	✓		



			(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP080 BTEXN	SOIL - S-18 (NO MOIST) TRH(C6-C9)/BTEXN with No Moisture for TBs
ES2125613-036	07-Jul-2021 00:00	TP44 0.4-0.5		✓	✓		
ES2125613-037	07-Jul-2021 00:00	TP44 0.6-0.7	✓				
ES2125613-038	07-Jul-2021 00:00	TP45 0.0-0.05		✓	✓		
ES2125613-039	07-Jul-2021 00:00	TP45 0.2-0.3		✓	✓		
ES2125613-040	07-Jul-2021 00:00	TP45 0.4-0.5	✓				
ES2125613-041	06-Jul-2021 00:00	QS01		✓	✓		
ES2125613-043	06-Jul-2021 00:00	QS03		✓	✓		
ES2125613-045	06-Jul-2021 00:00	QS05		✓	✓		
ES2125613-048	08-Jul-2021 00:00	Tripblank					✓
ES2125613-049	05-Jul-2021 00:00	Tripspike				✓	
ES2125613-063	05-Jul-2021 00:00	Trip Spike Control				✓	

Matrix: **SOLID**

Laboratory sample ID Sampling date / time Sample ID

Laboratory sample ID	Sampling date / time	Sample ID	(On Hold) SOLID No analysis requested
ES2125613-047	06-Jul-2021 00:00	ACM01	✓



Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - W-10 TRH/VOC/PAH
ES2125613-050	07-Jul-2021 00:00	W1	✓
ES2125613-051	07-Jul-2021 00:00	W3 Received as W2	✓
ES2125613-052	07-Jul-2021 00:00	MW01	✓
ES2125613-053	08-Jul-2021 00:00	MW03	✓
ES2125613-054	08-Jul-2021 00:00	MW04	✓
ES2125613-055	08-Jul-2021 00:00	MW05	✓
ES2125613-056	07-Jul-2021 00:00	MW06	✓
ES2125613-057	07-Jul-2021 00:00	MW07	✓
ES2125613-058	07-Jul-2021 00:00	MW08	✓
ES2125613-059	07-Jul-2021 00:00	MW11	✓
ES2125613-062	07-Jul-2021 00:00	MW12	✓

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP080 BTEXN	WATER - W-02 8 Metals	WATER - W-18 TRH(C6 - C9)/BTEXN
ES2125613-050	07-Jul-2021 00:00	W1		✓	
ES2125613-051	07-Jul-2021 00:00	W3 Received as W2		✓	
ES2125613-052	07-Jul-2021 00:00	MW01		✓	
ES2125613-053	08-Jul-2021 00:00	MW03		✓	
ES2125613-054	08-Jul-2021 00:00	MW04		✓	
ES2125613-055	08-Jul-2021 00:00	MW05		✓	
ES2125613-056	07-Jul-2021 00:00	MW06		✓	
ES2125613-057	07-Jul-2021 00:00	MW07		✓	
ES2125613-058	07-Jul-2021 00:00	MW08		✓	
ES2125613-059	07-Jul-2021 00:00	MW11		✓	
ES2125613-060	05-Jul-2021 00:00	Tripblank			✓
ES2125613-061	05-Jul-2021 00:00	Tripspike	✓		
ES2125613-062	07-Jul-2021 00:00	MW12		✓	

Proactive Holding Time Report

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



Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)

Email inbox@cavvanba.com

DREW WOOD

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- Chain of Custody (CoC) (COC)
- EDI Format - ENMRG (ENMRG)
- EDI Format - ESDAT (ESDAT)

Email drew@cavvanba.com
Email drew@cavvanba.com
Email drew@cavvanba.com
Email drew@cavvanba.com
Email drew@cavvanba.com
Email drew@cavvanba.com
Email drew@cavvanba.com

MICHAEL WRIGHT

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- Chain of Custody (CoC) (COC)
- EDI Format - ENMRG (ENMRG)
- EDI Format - ESDAT (ESDAT)

Email michael@cavvanba.com
Email michael@cavvanba.com
Email michael@cavvanba.com
Email michael@cavvanba.com
Email michael@cavvanba.com
Email michael@cavvanba.com
Email michael@cavvanba.com

ROB MCLELLAND

- A4 - AU Tax Invoice (INV)

Email rob@cavvanba.com



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2125613**

Client	: CAVVANBA CONSULTING	Laboratory	: Environmental Division Sydney
Contact	: MR DREW WOOD	Contact	: Brenda Hong
Address	: PO Box 322 NEWCASTLE 2300	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: drew@cavvanba.com	E-mail	: Brenda.Hong@ALSGlobal.com
Telephone	: +61 02 6685 7811	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 6685 5083	Facsimile	: +61-2-8784 8500
Project	: 20025.76	Page	: 1 of 5
Order number	: 20025.76	Quote number	: ES2020CAVCON0008 (SY/159/20)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: DREW WOOD, MICHAEL WRIGHT		

Dates

Date Samples Received	: 09-Jul-2021 13:37	Issue Date	: 13-Jul-2021
Client Requested Due Date	: 19-Jul-2021	Scheduled Reporting Date	: 19-Jul-2021

Delivery Details

Mode of Delivery	: Undefined	Security Seal	: Not Available
No. of coolers/boxes	: ----	Temperature	: -2.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 60 / 42

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **This workorder has been split from ES2125612 and ES2125433.**
- **Samples QS02, QS04, QS06 and QW02 have been forwarded to Eurofins.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP080 BTEXN	SOIL - S-18 (NO MOIST) TRH(C6-C9)/BTEXN with No Moisture for TBs
ES2125613-001	06-Jul-2021 00:00	TP32 0.4-0.5	✓				
ES2125613-002	06-Jul-2021 00:00	TP32 0.9-1.0	✓				
ES2125613-003	06-Jul-2021 00:00	TP33 0.0-0.05		✓	✓		
ES2125613-004	06-Jul-2021 00:00	TP33 0.4-0.5		✓	✓		
ES2125613-005	06-Jul-2021 00:00	TP33 0.9-1.0	✓				
ES2125613-006	06-Jul-2021 00:00	TP34 0.0-0.05		✓	✓		
ES2125613-007	06-Jul-2021 00:00	TP34 0.4-0.5		✓	✓		
ES2125613-008	06-Jul-2021 00:00	TP34 1.9-2.0	✓				
ES2125613-009	06-Jul-2021 00:00	TP35 0.0-0.05		✓	✓		
ES2125613-010	06-Jul-2021 00:00	TP35 0.4-0.5		✓	✓		
ES2125613-011	06-Jul-2021 00:00	TP35 2.4-2.5	✓				
ES2125613-012	06-Jul-2021 00:00	TP36 0.0-0.05		✓	✓		
ES2125613-013	06-Jul-2021 00:00	TP36 0.9-1.0		✓	✓		
ES2125613-014	06-Jul-2021 00:00	TP36 2.4-2.5	✓				
ES2125613-015	07-Jul-2021 00:00	TP37 0.0-0.05		✓	✓		
ES2125613-016	07-Jul-2021 00:00	TP37 0.4-0.5	✓				
ES2125613-017	07-Jul-2021 00:00	TP370.9-1.0	✓				
ES2125613-018	07-Jul-2021 00:00	TP38 0.0-0.05		✓	✓		
ES2125613-019	07-Jul-2021 00:00	TP38 0.4-0.5	✓				
ES2125613-020	07-Jul-2021 00:00	TP38 0.9-1.0	✓				
ES2125613-021	07-Jul-2021 00:00	TP39 0.0-0.05		✓	✓		
ES2125613-022	07-Jul-2021 00:00	TP39 0.3-0.4		✓	✓		
ES2125613-023	07-Jul-2021 00:00	TP39 0.9-1.0	✓				
ES2125613-024	07-Jul-2021 00:00	TP40 0.0-0.05		✓	✓		
ES2125613-025	07-Jul-2021 00:00	TP40 0.4-0.5	✓				
ES2125613-026	07-Jul-2021 00:00	TP40 0.9-1.0	✓				
ES2125613-027	07-Jul-2021 00:00	TP41 0.0-0.05		✓	✓		
ES2125613-028	07-Jul-2021 00:00	TP41 0.4-0.5	✓				
ES2125613-029	07-Jul-2021 00:00	TP42 0.0-0.05		✓	✓		
ES2125613-030	07-Jul-2021 00:00	TP42 0.4-0.5		✓	✓		
ES2125613-031	07-Jul-2021 00:00	TP42 0.6-0.7	✓				
ES2125613-032	07-Jul-2021 00:00	TP43 0.0-0.05		✓	✓		
ES2125613-033	07-Jul-2021 00:00	TP43 0.4-0.5	✓				
ES2125613-034	07-Jul-2021 00:00	TP43 0.9-1.0		✓	✓		
ES2125613-035	07-Jul-2021 00:00	TP44 0.0-0.05		✓	✓		



			(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP080 BTEXN	SOIL - S-18 (NO MOIST) TRH(C6-C9)/BTEXN with No Moisture for TBs
ES2125613-036	07-Jul-2021 00:00	TP44 0.4-0.5		✓	✓		
ES2125613-037	07-Jul-2021 00:00	TP44 0.6-0.7	✓				
ES2125613-038	07-Jul-2021 00:00	TP45 0.0-0.05		✓	✓		
ES2125613-039	07-Jul-2021 00:00	TP45 0.2-0.3		✓	✓		
ES2125613-040	07-Jul-2021 00:00	TP45 0.4-0.5	✓				
ES2125613-041	06-Jul-2021 00:00	QS01		✓	✓		
ES2125613-043	06-Jul-2021 00:00	QS03		✓	✓		
ES2125613-045	06-Jul-2021 00:00	QS05		✓	✓		
ES2125613-048	08-Jul-2021 00:00	Tripblank					✓
ES2125613-049	05-Jul-2021 00:00	Tripspike				✓	
ES2125613-063	05-Jul-2021 00:00	Trip Spike Control				✓	

Matrix: **SOLID**

Laboratory sample ID Sampling date / time Sample ID

Laboratory sample ID	Sampling date / time	Sample ID	SOLID - EA200B Asbestos Identification in Bulk Solids (Excluding
ES2125613-047	06-Jul-2021 00:00	ACM01	✓



Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - W-10 TRH/VOC/PAH
ES2125613-050	07-Jul-2021 00:00	W1	✓
ES2125613-051	07-Jul-2021 00:00	W3 Received as W2	✓
ES2125613-052	07-Jul-2021 00:00	MW01	✓
ES2125613-053	08-Jul-2021 00:00	MW03	✓
ES2125613-054	08-Jul-2021 00:00	MW04	✓
ES2125613-055	08-Jul-2021 00:00	MW05	✓
ES2125613-056	07-Jul-2021 00:00	MW06	✓
ES2125613-057	07-Jul-2021 00:00	MW07	✓
ES2125613-058	07-Jul-2021 00:00	MW08	✓
ES2125613-059	07-Jul-2021 00:00	MW11	✓
ES2125613-062	07-Jul-2021 00:00	MW12	✓

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP080 BTEXN	WATER - W-02 8 Metals	WATER - W-18 TRH(C6 - C9)/BTEXN
ES2125613-050	07-Jul-2021 00:00	W1		✓	
ES2125613-051	07-Jul-2021 00:00	W3 Received as W2		✓	
ES2125613-052	07-Jul-2021 00:00	MW01		✓	
ES2125613-053	08-Jul-2021 00:00	MW03		✓	
ES2125613-054	08-Jul-2021 00:00	MW04		✓	
ES2125613-055	08-Jul-2021 00:00	MW05		✓	
ES2125613-056	07-Jul-2021 00:00	MW06		✓	
ES2125613-057	07-Jul-2021 00:00	MW07		✓	
ES2125613-058	07-Jul-2021 00:00	MW08		✓	
ES2125613-059	07-Jul-2021 00:00	MW11		✓	
ES2125613-060	05-Jul-2021 00:00	Tripblank			✓
ES2125613-061	05-Jul-2021 00:00	Tripspike	✓		
ES2125613-062	07-Jul-2021 00:00	MW12		✓	

Proactive Holding Time Report

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



Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)

Email inbox@cavvanba.com

DREW WOOD

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- Chain of Custody (CoC) (COC)
- EDI Format - ENMRG (ENMRG)
- EDI Format - ESDAT (ESDAT)

Email drew@cavvanba.com
Email drew@cavvanba.com
Email drew@cavvanba.com
Email drew@cavvanba.com
Email drew@cavvanba.com
Email drew@cavvanba.com
Email drew@cavvanba.com

MICHAEL WRIGHT

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- Chain of Custody (CoC) (COC)
- EDI Format - ENMRG (ENMRG)
- EDI Format - ESDAT (ESDAT)

Email michael@cavvanba.com
Email michael@cavvanba.com
Email michael@cavvanba.com
Email michael@cavvanba.com
Email michael@cavvanba.com
Email michael@cavvanba.com
Email michael@cavvanba.com

ROB MCLELLAND

- A4 - AU Tax Invoice (INV)

Email rob@cavvanba.com



CHAIN OF CUSTODY

ALS Laboratory
please tick →

CLIENT: Cavvanba Consulting	TURNAROUND REQUIREMENTS: Standard TAT may be longer for some tests e.g. Ultra Trace Organics	<input checked="" type="checkbox"/> Standard TAT (List due date): <input type="checkbox"/> Non Standard or urgent TAT (List due date):	FOR LABORATORY USE ONLY (Circle) Custody Seal Intact? Yes No <input checked="" type="radio"/> N/A Frozen ice bricks present upon receipt? Yes No N/A Random Sample Temperature on Receipt: 2.0 °C Other comment:
OFFICE: Newcastle	ALS QUOTE NO.: SY/159/20	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7	
PROJECT: 20025.76	ORDER NUMBER: 20025.76	PROJECT MANAGER: Drew Wood	CONTACT PH: 0403 689 755
SAMPLER: Michael Wright / Drew Wood	SAMPLER MOBILE: 0434 376 146	RELINQUISHED BY: M. Wright	RECEIVED BY: AL
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	DATE/TIME: 9/7/21 13:36	DATE/TIME: 9/7/21 1:37pm
Email Reports to (will default to PM if no other addresses are listed): drew@cavvanba.com, michael@cavvanba.com			DATE/TIME: 12/21/21
Email Invoice to (will default to PM if no other addresses are listed): rob@cavvanba.com			

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	CONTAINER INFORMATION TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	ANALYSIS REQUIRED including SUITES (NB Suite Codes must be listed to attract suite once) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)				Additional Information Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc
						W-TRIB/TEX/PAH/VOCS (W-10)	W - Metals (8)	S - Lead only	TRIB/TEXN	
1	TP32 0.4-0.5	6.7.21	Soil	1 x Jar	1					
2	↓ 0.9-1.0									
3	TP33 0.0-0.05									Subcon / Forward Lab: <u>ES2125612+</u>
4	↓ 0.4-0.5									Lab / Analysis: <u>ES2125433</u>
5	↓ 0.4-1.0									Organised By / Date: <u>Eurofins @S04 @S02,</u>
6	TP34 0.0-0.05									Relinquished By / Date: <u>@S06 @W02</u>
7	↓ 0.4-0.5									Control / Charter:
8	↓ 1.9-2.0									WON:
9	TP35 0.0-0.05									Attached by:
10	↓ 0.4-0.5									
11	↓ 2.4-2.5									
12	TP36 0.0-0.05									
13	↓ 0.9-1.0									
14	↓ 2.4-2.5									
15	TP37 0.0-0.05	7.7.21								
16	↓ 0.4-0.5									
17	↓ 0.9-1.0									

Environmental Division
Sydney
Work Order Reference
ES2125613



Telephone: +61-2-8784 8861

Water Container Codes: P = Unpreserved Plastic, N = Nitric Preserved Plastic, ORC = Nitric Preserved ORC, SH = Sodium Hydroxide/Cd Preserved, S = Sodium Hydroxide Preserved Plastic, AG = Amber Glass Unpreserved, AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved, VB = VOA Vial Sodium Bisulfate Preserved, VS = VOA Vial Sulfuric Preserved, AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass, H = HCl preserved Plastic, HS = HCl preserved Speciation bottle, SP = Sulfuric Preserved Plastic, F = Zinc Acetate Preserved Bottle, E = EDTA Preserved Bottles, ST = Sterile Bottle, ASS = Plastic Bag for Acid Sulphate Spills, B = Unpreserved Bag



CHAIN OF CUSTODY

ALS Laboratory
please tick →

CLIENT: Cavvanba Consulting	TURNAROUND REQUIREMENTS: * Standard TAT (List due date): (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	FOR LABORATORY USE ONLY (Circle) Custody Seal Intact? Yes No N/A Frozen / frozen ice bricks present upon receipt? Yes No N/A Random Sample Temperature on Receipt: -2.0 °C Other comment:
OFFICE: Newcastle	<input type="checkbox"/> Non Standard or urgent TAT (List due date):	
PROJECT: 20025.76	ALS QUOTE NO.: SY/139/20	
ORDER NUMBER: 20025.76	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7	
PROJECT MANAGER: Drew Wood	CONTACT PH: 0403 689 755	
SAMPLER: Michael Wright / Drew Wood	SAMPLER MOBILE: 0434 376 146	
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	RECEIVED BY: AL DATE/TIME: 1:37pm 9/7/21
Email Reports to (will default to PM if no other addresses are listed): drew@cavvanba.com, michael@cavvanba.com	RELINQUISHED BY: M. Wright DATE/TIME: 9/7/21 13:36	RECEIVED BY: JAN DATE/TIME: 12/7/21
Email Invoice to (will default to PM if no other addresses are listed): rob@cavvanba.com		

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS			CONTAINER INFORMATION			ANALYSIS REQUIRED including SUITES (NB Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).				Additional Information
	MATRIX	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	W - TRIBTEXN/PAH/VOCs (W-10)	W - Metals (S)	S - Lead only	TRIBTEXN		
	TP38	0.0-0.05	7.7.21	Serif	1 x J4						
	↓	0.4-0.5									
	↓	0.9-1.0									
	TP39	0.0-0.05									
	↓	0.3-0.4									
	↓	0.9-1.0									
	TP40	0.0-0.05									
	↓	0.4-0.5									
	↓	0.9-1.0									
	TP41	0.0-0.05									
	↓	0.4-0.5									
	TP42	0.0-0.05									
	↓	0.4-0.5									
	↓	0.6-0.7									
	TP43	0.0-0.05									
	↓	0.4-0.5									
	↓	0.9-1.0									

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; DRG = Nitric Preserved DRG; SH = Sodium Hydroxide/Gd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VS = VOA Vial Sodium Bisulfate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag



CHAIN OF CUSTODY

ALS Laboratory
please tick →

CLIENT: Cavanba Consulting	TURNAROUND REQUIREMENTS : <input checked="" type="checkbox"/> Standard TAT (List due date): <input type="checkbox"/> Non Standard or urgent TAT (List due date):	FOR LABORATORY USE ONLY (Circle) Custody Seal Intact? Yes No N/A Frozen ice bricks present upon receipt? Yes No N/A Random Sample Temperature on Receipt: -2.0 °C Other comment:
OFFICE: Newcastle	ALS QUOTE NO.: SY1159/20	
PROJECT: 20025.76	ORDER NUMBER: 20025.76	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7
PROJECT MANAGER: Drew Wood	CONTACT PH: 0403 689 755	RECEIVED BY: [Signature]
SAMPLER: Michael Wright / Drew Wood	SAMPLER MOBILE: 0434 376 146	RECEIVED DATE/TIME: 9/7/21
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	RELINQUISHED BY: M.Wright
Email Reports to (will default to PM if no other addresses are listed): drew@cavanba.com, michael@cavanba.com		RELINQUISHED DATE/TIME: 9/7/21
Email Invoice to (will default to PM if no other addresses are listed): rob@cavanba.com		RELINQUISHED DATE/TIME: 9/7/21

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION			ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)					Additional Information
	LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (to codes below)	(refer)	TOTAL CONTAINERS	TRIHTETXN/PAH/VOCs (W-10)	W - Metals (8)	S - Lead only	TRIHTETXN	
	35	TP44 0.0-0.05	7.7.21	S:1	1 x Jar		1			/		
	36	↓ 0.4-0.5	↓	↓	↓		↓			/		
	37	↓ 0.6-0.7	↓	↓	↓		↓			/		
	38	TP45 0.0-0.05	↓	↓	↓		↓			/		
	39	↓ 0.2-0.3	↓	↓	↓		↓			/		
	40	↓ 0.4-0.5	↓	↓	↓		↓			/		
	41	Q501	6.7.21	↓	↓		↓			/		
X		Q502	↓	↓	↓		↓			/		Please send Q502, Q503 & Q506 to Gwinne.
	43	Q503	↓	↓	↓		↓			/		
X		Q504	↓	↓	↓		↓			/		
	45	Q505	↓	↓	↓		↓			/		
X		Q506	↓	↓	↓		↓			/		
	47	ACM01	6.7.21	Asbestos	1 x 2 plate		1					
	48	Triplank	8.7.21	S:1	1 x Jar		1			/		
	49	Tripspike	5.7.21	L	↓		1			/		
	50	W1	7.7.21	Water	1XP, 2XU, 1XA		4					
X		W2	5.7.21	↓	↓		↓					Dates on Coc are correct

Water Container Codes: P = Unpreserved Plastic, N = Nitric Preserved Plastic, ORC = Nitric Preserved ORC, SH = Sodium Hydroxide/Cd Preserved, S = Sodium Hydroxide Preserved Plastic, AG = Amber Glass Unpreserved, AP = Airfreight Unpreserved Plastic
 V = VOA Vial HCl Preserved, VB = VOA Vial Sodium Bisulphate Preserved, VS = VOA Vial Sulfuric Preserved, AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass, H = HCl Preserved Plastic, HS = HCl Preserved Specimen bottle, SP = Sulfuric Preserved Plastic, F = Formaldehyde Preserved Glass
 Z = Zinc Acetate Preserved Bottle, E = EDTA Preserved Bottles, ST = Sterile Bottle, ASS = Plastic Bag for Acid Sulphate Soils, B = Unpreserved Bag



CHAIN OF CUSTODY

ALS Laboratory
please tick →

CLIENT: Cavanba Consulting	TURNAROUND REQUIREMENTS: * Standard TAT (List due date): (Standard TAT may be longer for some tests e.g Ultra Trace Organics) <input type="checkbox"/> Non Standard or urgent TAT (List due date):	FOR LABORATORY USE ONLY (Circle) Custody Seal Intact? Yes No (N/A) Fragile / Broken ice bricks present upon receipt? (Yes) No (N/A)
OFFICE: Newcastle	ALS QUOTE NO.: SY159/20	Random Sample Temperature on Receipt: -2.0 °C Other comment:
PROJECT: 20025.76	ORDER NUMBER: 20025.76	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 8 OF: 1 2 3 4 5 6 8
PROJECT MANAGER: Drew Wood	CONTACT PH: 0403 689 755	RECEIVED BY: AC DATE/TIME: 1:37 PM
SAMPLER: Michael Wright / Drew Wood	SAMPLER MOBILE: 0434 376 146	RECEIVED BY: FM DATE/TIME: 12/11/21
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	RELINQUISHED BY: M. Wright DATE/TIME: 9/17/21 13:36
Email Reports to (will default to PM if no other addresses are listed): drew@cavvanba.com, michael@cavvanba.com	Email invoice to (will default to PM if no other addresses are listed): rob@cavvanba.com	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION			ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)					Additional Information
	LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (to codes below)	(refer)	TOTAL CONTAINERS	W - TRIMTEX/PAH/AVOCs (W-10)	W - Metals (B)	S - Lead only	TRIMTEXN	
	51	W3 Received as W2	7.7.21	Water	2V, 1A, 1P		4	/	/			
	52	MW01	↓					/	/			
	x	MW02	5.7.21					/	/			Dates on spec
	53	MW03	6.7.21					/	/			one
	54	MW04	↓					/	/			Correct
	55	MW05	↓					/	/			
	56	MW06	7.7.21					/	/			
	57	MW07	↓					/	/			
	58	MW08	↓					/	/			
	x	MW09	5.7.21					/	/			
	x	MW10	↓					/	/			
	59	MW11	7.7.21					/	/			
	x	QW01	5.7.21					/	/			
	x	QW02	↓					/	/			
	60	Triphala			1 x vial		1					Please send QW02 to Eurofins
	61	Purple			1 x vial		1					
	62	MW12	7.7.21		2V, 1A, 1P		4	-	-			

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airtight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airtight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Specimen bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag

CERTIFICATE OF ANALYSIS

Work Order : ES2125423 Client : CAVVANBA CONSULTING Contact : MR DREW WOOD Address : PO Box 322 NEWCASTLE 2300 Telek6one : +41 02 4495 7911 Project : 20025.74 Order number : 20025.74 C-O-C number : ---- Samkler : ---- Site : ---- Quote number : SG05p20 No. of samkles received : 4 No. of samkles analysed : 4	Page : 1 of 8 Laboratory : Environmental Division Sydney Contact : Brenda Hong Address : 277-29p Woodkarh Road Smit6field NSW Australia 2148 Telek6one : +41 2 9798 9555 Date Samkles Received : 20-Jul-2021 19:53 Date Analysis Commenced : 22-Jul-2021 Issue Date : 24-Jul-2021 19:23
--	--



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

T6is rekort sukersedes any krevius rekort6/ (it6 t6is reference. Results akkly to t6e samkle6/ as submitted) unless t6e samkling (as conducted by ALS. T6is document s6all not be rekroded) excekt in full.

T6is Certificate of Analysis contains t6e follo(ing information:

- weneral Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

T6is document 6as been electronically signed by t6e aut6orized signatories belo(. Electronic signing is carried out in comkpliance (it6 krocedures skecified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ivan Taylor	Analyst	Sydney Inorganics) Smit6field) NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In-house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry (weight) basis.

Where a reported less than LOR result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample, reduced (weight) employed, or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown (without a time component). In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits, the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP21 0.9-0.7	TP22 0.3-0.9	TP23 1.6-2.0	TP31 0.9-0.7	TP38 0.9-0.7
Sampling date / time				04-Jul-2021 00:00	04-Jul-2021 00:00	04-Jul-2021 00:00	04-Jul-2021 00:00	07-Jul-2021 00:00	
Compound	CAS Number	LOR	Unit	ES2125423-001	ES2125423-002	ES2125423-003	ES2125423-009	ES2125423-007	
				Result	Result	Result	Result	Result	
EA077: Moisture Content (Dried @ 107-110°C)									
Moisture Content	----	0.1	%	20.7	16.5	17.3	19.6	15.0	
EG007(ED063)T: Total Metals by ICP-AES									
Lead	783p-p2-1	5	mg/g	1280	11	6	30	29	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP99 0.5-0.8	----	----	----	----
Sampling date / time			07-Jul-2021 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	ES2125423-005	-----	-----	-----	-----
Result				Result	----	----	----	----
EA077: Moisture Content (Dried @ 107-110°C)								
Moisture Content	----	0.1	%	17.1	----	----	----	----
EG007(ED063)T: Total Metals by ICP-AES								
Lead	783p-p2-1	5	mg/kg	21	----	----	----	----

QUALITY CONTROL REPORT

Work Order	: ES2125423	Page	: 1 of 3
Client	: CAVVANBA CONSULTING	Laboratory	: Environmental Division Sydney
Contact	: MR DREW WOOD	Contact	: Brenda Hong
Address	: PO Box 322 NEWCASTLE 2300	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 6685 7811	Telephone	: +61 2 8784 8555
Project	: 20025.76	Date Samples Received	: 20-Jul-2021
Order number	: 20025.76	Date Analysis Commenced	: 22-Jul-2021
C-O-C number	: ----	Issue Date	: 26-Jul-2021
Sampler	: ----		
Site	: ----		
Quote number	: SGQ59Q0		
No. of samples received	: 6		
No. of samples analysed	: 6		



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DW)/ Report Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report Recovery and Acceptance Limits
- Matrix Spike (MS) Report Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ivan Taylor	Analyst	Sydney (Inorganics) Smithfield NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the wSEPA) APHA) AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed) results are reported on a dry (eight basis.

Where a reported less than Y/ result is higher than the LOR) this may be due to primary sample extract@igestate dilution and@r insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR) this may be due to high

- Key :
- Anonymous = Refers to samples (igh are not specifically part of this (ork order but formed part of the , C process lot
 - CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 - LOR = Limit of reporting
 - RPD = Relative Percentage Difference
 - # = Indicates failed , C

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method , WI-ENG38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit Result bet(een 10 and 20 times LOR: 0% - 50% Result > 20 times LOR: 0% - 20%.

Sub-Matrix: SOIL

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG00((E90) 3tT: Toā Mā eā M y- ICPAES IQC Loā 340(00) t									
ES2126823-005	TP37 0.4-0.5	EV005T: Lead	7439-92-1	5	mg@g	24	22	7.7	No Limit
ES2126781-001	Anonymous	EV005T: Lead	7439-92-1	5	mg@g	32	30	8.9	No Limit
EA0((: s oibaure ConānaD ried @ 10(7110°Ct IQC Loā 340(018t									
ES2126781-004	Anonymous	EA055: Moisture Content	----	0.1	%	24.3	23.6	3.0	0% - 20%



Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this , C parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material or a known interference free matrix spiked with target analytes. The purpose of this , C parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike	Spike Recovery (%)	Acceptable Limits (%)	
					Concentration	LCS	Low	High
EG00(090) 3tT: Tod Ms ed Ny- ICP7AES QCLoα 340(00) t								
EV005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	84.9	82.0	119

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this , C parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data , Quality Objectives (D, Os). Ideal recovery ranges stated may be achieved in the event of sample matrix interference.

Sub-Matrix: SOIL

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Concentration	MS	Low	High
EG00(090) 3tT: Tod Ms ed Ny- ICP7AES QCLoα 340(00) t							
ES2126781-001	Anonymous	EV005T: Lead	7439-92-1	250 mg/kg	90.4	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2126823	Page	: 1 of 4
Client	: CAVVANBA CONSULTING	Laboratory	: Environmental Division Sydney
Contact	: MR DREW WOOD	Telephone	: +61 2 8784 8555
Project	: 20025.76	Date Samples Received	: 20-Jul-2021
Site	: ----	Issue Date	: 26-Jul-2021
Sampler	: ----	No. of samples received	: 6
Order number	: 20025.76	No. of samples analysed	: 6

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- For all regular sample matrices, **NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers exist - please see following pages for full details.



Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method	Extraction / Preparation			Analysis			
	Container / Client Sample ID(s)	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved							
TP21 0.4-0.5, TP23 1.9-2.0,	TP22 0.3-0.4, TP31 0.4-0.5	----	----	----	22-Jul-2021	20-Jul-2021	2
Soil Glass Jar - Unpreserved							
TP37 0.4-0.5,	TP44 0.6-0.7	----	----	----	22-Jul-2021	21-Jul-2021	1

Outliers : Frequency of Quality Control Samples

Matrix: **SOIL**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Moisture Content	1	11	9.09	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for **VOC in soils** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis			
		Container / Client Sample ID(s)	Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)								
Soil Glass Jar - Unpreserved (EA055)								
TP21 0.4-0.5, TP23 1.9-2.0,	06-Jul-2021	TP22 0.3-0.4, TP31 0.4-0.5	----	----	----	22-Jul-2021	20-Jul-2021	*
Soil Glass Jar - Unpreserved (EA055)								
TP37 0.4-0.5,	07-Jul-2021	TP44 0.6-0.7	----	----	----	22-Jul-2021	21-Jul-2021	*
EG005(ED093): Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T)								
TP21 0.4-0.5, TP23 1.9-2.0,	06-Jul-2021	TP22 0.3-0.4, TP31 0.4-0.5	22-Jul-2021	02-Jan-2022	✓	23-Jul-2021	02-Jan-2022	✓
Soil Glass Jar - Unpreserved (EG005T)								
TP37 0.4-0.5,	07-Jul-2021	TP44 0.6-0.7	22-Jul-2021	03-Jan-2022	✓	23-Jul-2021	03-Jan-2022	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Moisture Content	EA055	1	11	9.09	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	12	16.67	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Total Metals by ICP-AES	EG005T	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Total Metals by ICP-AES	EG005T	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Total Metals by ICP-AES	EG005T	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

<i>Analytical Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).

Cavvanba Consulting
1 / 66 Centennial Cct
Byron Bay
NSW 2481



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 NATA is a signatory to the ILAC Mutual Recognition
 Arrangement for the mutual recognition of the
 equivalence of testing, medical testing, calibration,
 inspection and proficiency testing scheme providers
 reports.

Attention: **Drew Wood**

Report **802648-S**
 Project name **20025.76**
 Received Date **Jun 11, 2021**

Client Sample ID			QS02
Sample Matrix			Soil
Eurofins Sample No.			S21-Jn26087
Date Sampled			Jun 11, 2021
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	< 50
TRH C29-C36	50	mg/kg	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50
Naphthalene ^{N02}	0.5	mg/kg	< 0.5
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20
TRH >C10-C16	50	mg/kg	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	88
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5
Chrysene	0.5	mg/kg	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5

Client Sample ID			QS02
Sample Matrix			Soil
Eurofins Sample No.			S21-Jn26087
Date Sampled			Jun 11, 2021
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	< 0.5
Total PAH*	0.5	mg/kg	< 0.5
2-Fluorobiphenyl (surr.)	1	%	97
p-Terphenyl-d14 (surr.)	1	%	123
Heavy Metals			
Arsenic	2	mg/kg	16
Cadmium	0.4	mg/kg	0.6
Chromium	5	mg/kg	39
Copper	5	mg/kg	180
Lead	5	mg/kg	250
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	19
Zinc	5	mg/kg	400
% Moisture			
	1	%	18

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Jun 15, 2021	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Jun 15, 2021	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Jun 15, 2021	14 Days
BTEX - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Jun 15, 2021	14 Days
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Sydney	Jun 15, 2021	14 Days
Metals M8 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	Jun 15, 2021	180 Days
% Moisture - Method: LTM-GEN-7080 Moisture	Sydney	Jun 11, 2021	14 Days

Australia

Melbourne
6 Monterey Road
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NATA # 1261
Site # 1254 & 14271

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Unit F3, Building F
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43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name:	Cavvanba Consulting	Order No.:	20021.76	Received:	Jun 11, 2021 5:20 PM
Address:	1 / 66 Centennial Cct Byron Bay NSW 2481	Report #:	802648	Due:	Jun 21, 2021
Project Name:	20025.76	Phone:	02 6685 7811	Priority:	5 Day
		Fax:	02 6685 5083	Contact Name:	Drew Wood
Eurofins Analytical Services Manager : Andrew Black					

Sample Detail						HOLD	Moisture Set	Eurofins Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
Mayfield Laboratory - NATA Site # 25079								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	QS02	Jun 11, 2021		Soil	S21-Jn26087		X	X
2	QS04	Jun 11, 2021		Soil	S21-Jn26088	X		
Test Counts						1	1	1

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							
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	
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							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g,h,i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a,h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	76			70-130	Pass	
TRH C10-C14	%	76			70-130	Pass	
Naphthalene	%	83			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code	
TRH C6-C10	%	75			70-130	Pass		
TRH >C10-C16	%	76			70-130	Pass		
LCS - % Recovery								
BTEX								
Benzene	%	93			70-130	Pass		
Toluene	%	88			70-130	Pass		
Ethylbenzene	%	86			70-130	Pass		
m&p-Xylenes	%	88			70-130	Pass		
o-Xylene	%	90			70-130	Pass		
Xylenes - Total*	%	89			70-130	Pass		
LCS - % Recovery								
Polycyclic Aromatic Hydrocarbons								
Acenaphthene	%	93			70-130	Pass		
Acenaphthylene	%	96			70-130	Pass		
Anthracene	%	95			70-130	Pass		
Benz(a)anthracene	%	119			70-130	Pass		
Benzo(a)pyrene	%	92			70-130	Pass		
Benzo(b&j)fluoranthene	%	100			70-130	Pass		
Benzo(g,h,i)perylene	%	94			70-130	Pass		
Benzo(k)fluoranthene	%	107			70-130	Pass		
Chrysene	%	118			70-130	Pass		
Dibenz(a,h)anthracene	%	100			70-130	Pass		
Fluoranthene	%	120			70-130	Pass		
Fluorene	%	96			70-130	Pass		
Indeno(1,2,3-cd)pyrene	%	99			70-130	Pass		
Naphthalene	%	102			70-130	Pass		
Phenanthrene	%	97			70-130	Pass		
Pyrene	%	120			70-130	Pass		
LCS - % Recovery								
Heavy Metals								
Arsenic	%	92			80-120	Pass		
Cadmium	%	93			80-120	Pass		
Chromium	%	94			80-120	Pass		
Copper	%	92			80-120	Pass		
Lead	%	90			80-120	Pass		
Mercury	%	95			80-120	Pass		
Nickel	%	95			80-120	Pass		
Zinc	%	92			80-120	Pass		
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery								
Total Recoverable Hydrocarbons				Result 1				
TRH C6-C9	S21-Jn31584	NCP	%	75		70-130	Pass	
TRH C10-C14	B21-Jn26769	NCP	%	97		70-130	Pass	
Naphthalene	S21-Jn31584	NCP	%	76		70-130	Pass	
TRH C6-C10	S21-Jn31584	NCP	%	76		70-130	Pass	
TRH >C10-C16	B21-Jn26769	NCP	%	97		70-130	Pass	
Spike - % Recovery								
BTEX				Result 1				
Benzene	S21-Jn31584	NCP	%	92		70-130	Pass	
Toluene	S21-Jn31584	NCP	%	89		70-130	Pass	
Ethylbenzene	S21-Jn31584	NCP	%	86		70-130	Pass	
m&p-Xylenes	S21-Jn31584	NCP	%	89		70-130	Pass	
o-Xylene	S21-Jn31584	NCP	%	89		70-130	Pass	
Xylenes - Total*	S21-Jn31584	NCP	%	89		70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S21-Jn28634	NCP	%	119			70-130	Pass	
Acenaphthylene	S21-Jn28634	NCP	%	121			70-130	Pass	
Anthracene	S21-Jn28634	NCP	%	121			70-130	Pass	
Benz(a)anthracene	S21-Jn27705	NCP	%	81			70-130	Pass	
Benzo(a)pyrene	S21-Jn28634	NCP	%	127			70-130	Pass	
Benzo(b&j)fluoranthene	S21-Jn28634	NCP	%	108			70-130	Pass	
Benzo(g,h,i)perylene	S21-Jn28634	NCP	%	112			70-130	Pass	
Benzo(k)fluoranthene	S21-Jn27705	NCP	%	78			70-130	Pass	
Chrysene	S21-Jn27705	NCP	%	81			70-130	Pass	
Dibenz(a,h)anthracene	S21-Jn28634	NCP	%	125			70-130	Pass	
Fluoranthene	S21-Jn27705	NCP	%	86			70-130	Pass	
Fluorene	S21-Jn28634	NCP	%	116			70-130	Pass	
Indeno(1,2,3-cd)pyrene	S21-Jn28634	NCP	%	111			70-130	Pass	
Naphthalene	S21-Jn27705	NCP	%	75			70-130	Pass	
Phenanthrene	S21-Jn28634	NCP	%	121			70-130	Pass	
Pyrene	S21-Jn28634	NCP	%	129			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S21-Jn28845	NCP	%	96			75-125	Pass	
Cadmium	S21-Jn28845	NCP	%	92			75-125	Pass	
Chromium	S21-Jn28845	NCP	%	98			75-125	Pass	
Copper	S21-Jn28845	NCP	%	97			75-125	Pass	
Lead	S21-Jn28845	NCP	%	92			75-125	Pass	
Mercury	S21-Jn28845	NCP	%	98			75-125	Pass	
Nickel	S21-Jn28845	NCP	%	94			75-125	Pass	
Zinc	S21-Jn28845	NCP	%	86			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	S21-Jn31583	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S21-Jn25975	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S21-Jn25975	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S21-Jn25975	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Naphthalene	S21-Jn31583	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S21-Jn31583	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S21-Jn25975	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S21-Jn25975	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S21-Jn25975	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S21-Jn31583	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S21-Jn31583	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S21-Jn31583	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S21-Jn31583	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S21-Jn31583	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S21-Jn31583	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S21-Jn24911	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S21-Jn24911	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S21-Jn24911	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S21-Jn24911	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Benzo(a)pyrene	S21-Jn24911	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S21-Jn24911	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g,h,i)perylene	S21-Jn24911	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S21-Jn24911	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S21-Jn24911	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a,h)anthracene	S21-Jn24911	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S21-Jn24911	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S21-Jn24911	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1,2,3-cd)pyrene	S21-Jn24911	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S21-Jn24911	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S21-Jn24911	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S21-Jn24911	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S21-Jn28841	NCP	mg/kg	9.6	8.3	14	30%	Pass	
Cadmium	S21-Jn28841	NCP	mg/kg	1.9	1.8	9.0	30%	Pass	
Chromium	S21-Jn28841	NCP	mg/kg	14	14	6.0	30%	Pass	
Copper	S21-Jn28833	NCP	mg/kg	20	20	2.0	30%	Pass	
Lead	S21-Jn28841	NCP	mg/kg	72	69	5.0	30%	Pass	
Mercury	S21-Jn28841	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S21-Jn28841	NCP	mg/kg	8.3	8.1	2.0	30%	Pass	
Zinc	S21-Jn28841	NCP	mg/kg	400	660	48	30%	Fail	Q02
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S21-Jn26086	NCP	%	14	14	<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
Q02	The duplicate %RPD is outside the recommended acceptance criteria. Further analysis indicates sample heterogeneity as the cause

Authorised by:

Andrew Black	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
John Nguyen	Senior Analyst-Metal (NSW)
Roopesh Rangarajan	Senior Analyst-Volatile (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](#).

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NATA # 1261 Site # 18217

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NATA # 1261 Site # 20794

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

Company Name: Cavvanba Consulting
Address: 1 / 66 Centennial Cct
Byron Bay
NSW 2481
Project Name: 20025.76

Order No.: 20021.76
Report #: 802648
Phone: 02 6685 7811
Fax: 02 6685 5083

Received: Jun 11, 2021 5:20 PM
Due: Jun 21, 2021
Priority: 5 Day
Contact Name: Drew Wood

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						HOLD	Moisture Set	Eurofins Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
Mayfield Laboratory - NATA Site # 25079								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	QS02	Jun 11, 2021		Soil	S21-Jn26087		X	X
2	QS04	Jun 11, 2021		Soil	S21-Jn26088	X		
Test Counts						1	1	1

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IANZ # 1327

Christchurch

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

Sample Receipt Advice

Company name: Cavvanba Consulting
Contact name: Drew Wood
Project name: 20025.76
Project ID: Not provided
Turnaround time: 5 Day
Date/Time received: Jun 11, 2021 5:20 PM
Eurofins reference: 802648

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ Sample Temperature of a random sample selected from the batch as recorded by Eurofins Sample Receipt : 3.6 degrees Celsius.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- ✓ Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✗ Split sample sent to requested external lab.
- ✗ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Contact

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

Andrew Black on phone : (+61) 2 9900 8490 or by email: AndrewBlack@eurofins.com

Results will be delivered electronically via email to Drew Wood - drew@cavvanba.com.

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

Cavvanba Consulting
1 / 66 Centennial Cct
Byron Bay
NSW 2481



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 NATA is a signatory to the ILAC Mutual Recognition
 Arrangement for the mutual recognition of the
 equivalence of testing, medical testing, calibration,
 inspection, proficiency testing scheme providers and
 reference materials producers reports and certificates.

Attention: **Drew Wood**

Report **810223-S**

Project name

Project ID **20025.76**

Received Date Jul 13, 2021

Client Sample ID			QS02	QS04	QS06
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S21-JI23672	S21-JI23673	S21-JI23674
Date Sampled			Jul 06, 2021	Jul 06, 2021	Jul 06, 2021
Test/Reference	LOR	Unit			
Heavy Metals					
Lead	5	mg/kg	280	240	100
% Moisture	1	%	8.2	22	20

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	Jul 15, 2021	180 Days
% Moisture - Method: LTM-GEN-7080 Moisture	Sydney	Jul 13, 2021	14 Days

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

Company Name:	Cavvanba Consulting	Order No.:	20025.76	Received:	Jul 13, 2021 4:00 PM
Address:	1 / 66 Centennial Cct Byron Bay NSW 2481	Report #:	810223	Due:	Jul 20, 2021
Project Name:		Phone:	02 6685 7811	Priority:	5 Day
Project ID:	20025.76	Fax:	02 6685 5083	Contact Name:	Drew Wood

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Lead	Volatlie Organics	Moisture Set	Eurofins Suite B7 (filtered metals)
Melbourne Laboratory - NATA Site # 1254									
Sydney Laboratory - NATA Site # 18217						X	X	X	X
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
Mayfield Laboratory - NATA Site # 25079									
External Laboratory									
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID				
1	QS02	Jul 06, 2021		Soil	S21-JI23672	X		X	
2	QS04	Jul 06, 2021		Soil	S21-JI23673	X		X	
3	QS06	Jul 06, 2021		Soil	S21-JI23674	X		X	
4	QW02	Jul 04, 2021		Water	S21-JI23675		X		X
Test Counts						3	1	3	1

Internal Quality Control Review and Glossary
General

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

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test				Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code		
Method Blank											
Heavy Metals											
Lead				mg/kg	< 5		5	Pass			
LCS - % Recovery											
Heavy Metals											
Lead				%	97		80-120	Pass			
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code		
Spike - % Recovery											
Heavy Metals											
Lead				S21-JI23493	NCP	%	97		75-125	Pass	
Duplicate											
Heavy Metals											
Lead				S21-JI23502	NCP	mg/kg	21	18	16	30%	Pass
Duplicate											
% Moisture				S21-JI23438	NCP	%	21	20	5.0	30%	Pass

Comments**Sample Integrity**

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

Authorised by:

Emma Beesley
John Nguyen

Analytical Services Manager
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](#).

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Accreditation Number 1261
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 Arrangement for the mutual recognition of the
 equivalence of testing, medical testing, calibration,
 inspection, proficiency testing scheme providers and
 reference materials producers reports and certificates.

Attention: **Drew Wood**

Report **810223-W**

Project name

Project ID **20025.76**

Received Date **Jul 13, 2021**

Client Sample ID			QW02
Sample Matrix			Water
Eurofins Sample No.			S21-JI23675
Date Sampled			Jul 04, 2021
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons			
TRH C6-C9	0.02	mg/L	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1
Naphthalene ^{N02}	0.01	mg/L	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003
4-Bromofluorobenzene (surr.)	1	%	92
Volatile Organics			
1.1-Dichloroethane	0.001	mg/L	< 0.001
1.1-Dichloroethene	0.001	mg/L	< 0.001
1.1.1-Trichloroethane	0.001	mg/L	< 0.001
1.1.1.2-Tetrachloroethane	0.001	mg/L	< 0.001
1.1.2-Trichloroethane	0.001	mg/L	< 0.001
1.1.2.2-Tetrachloroethane	0.001	mg/L	< 0.001
1.2-Dibromoethane	0.001	mg/L	< 0.001
1.2-Dichlorobenzene	0.001	mg/L	< 0.001
1.2-Dichloroethane	0.001	mg/L	< 0.001
1.2-Dichloropropane	0.001	mg/L	< 0.001
1.2.3-Trichloropropane	0.001	mg/L	< 0.001
1.2.4-Trimethylbenzene	0.001	mg/L	< 0.001
1.3-Dichlorobenzene	0.001	mg/L	< 0.001

Client Sample ID			QW02
Sample Matrix			Water
Eurofins Sample No.			S21-JI23675
Date Sampled			Jul 04, 2021
Test/Reference	LOR	Unit	
Volatile Organics			
1,3-Dichloropropane	0.001	mg/L	< 0.001
1,3,5-Trimethylbenzene	0.001	mg/L	< 0.001
1,4-Dichlorobenzene	0.001	mg/L	< 0.001
2-Butanone (MEK)	0.001	mg/L	< 0.001
2-Propanone (Acetone)	0.001	mg/L	< 0.001
4-Chlorotoluene	0.001	mg/L	< 0.001
4-Methyl-2-pentanone (MIBK)	0.001	mg/L	< 0.001
Allyl chloride	0.001	mg/L	< 0.001
Benzene	0.001	mg/L	< 0.001
Bromobenzene	0.001	mg/L	< 0.001
Bromochloromethane	0.001	mg/L	< 0.001
Bromodichloromethane	0.001	mg/L	< 0.001
Bromoform	0.001	mg/L	< 0.001
Bromomethane	0.001	mg/L	< 0.001
Carbon disulfide	0.001	mg/L	< 0.001
Carbon Tetrachloride	0.001	mg/L	< 0.001
Chlorobenzene	0.001	mg/L	< 0.001
Chloroethane	0.001	mg/L	< 0.001
Chloroform	0.005	mg/L	< 0.005
Chloromethane	0.001	mg/L	< 0.001
cis-1,2-Dichloroethene	0.001	mg/L	< 0.001
cis-1,3-Dichloropropene	0.001	mg/L	< 0.001
Dibromochloromethane	0.001	mg/L	< 0.001
Dibromomethane	0.001	mg/L	< 0.001
Dichlorodifluoromethane	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
Iodomethane	0.001	mg/L	< 0.001
Isopropyl benzene (Cumene)	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
Methylene Chloride	0.001	mg/L	< 0.001
o-Xylene	0.001	mg/L	< 0.001
Styrene	0.001	mg/L	< 0.001
Tetrachloroethene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
trans-1,2-Dichloroethene	0.001	mg/L	< 0.001
trans-1,3-Dichloropropene	0.001	mg/L	< 0.001
Trichloroethene	0.001	mg/L	< 0.001
Trichlorofluoromethane	0.001	mg/L	< 0.001
Vinyl chloride	0.001	mg/L	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003
Total MAH*	0.003	mg/L	< 0.003
Vic EPA IWRG 621 CHC (Total)*	0.005	mg/L	< 0.005
Vic EPA IWRG 621 Other CHC (Total)*	0.005	mg/L	< 0.005
4-Bromofluorobenzene (surr.)	1	%	92
Toluene-d8 (surr.)	1	%	91

Client Sample ID			QW02
Sample Matrix			Water
Eurofins Sample No.			S21-JI23675
Date Sampled			Jul 04, 2021
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Acenaphthene	0.001	mg/L	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001
Anthracene	0.001	mg/L	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001
Chrysene	0.001	mg/L	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001
Fluoranthene	0.001	mg/L	< 0.001
Fluorene	0.001	mg/L	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001
Naphthalene	0.001	mg/L	< 0.001
Phenanthrene	0.001	mg/L	< 0.001
Pyrene	0.001	mg/L	< 0.001
Total PAH*	0.001	mg/L	< 0.001
2-Fluorobiphenyl (surr.)	1	%	91
p-Terphenyl-d14 (surr.)	1	%	143
Heavy Metals			
Arsenic (filtered)	0.001	mg/L	< 0.001
Cadmium (filtered)	0.0002	mg/L	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001
Copper (filtered)	0.001	mg/L	< 0.001
Lead (filtered)	0.001	mg/L	< 0.001
Mercury (filtered)	0.0001	mg/L	< 0.0001
Nickel (filtered)	0.001	mg/L	< 0.001
Zinc (filtered)	0.005	mg/L	< 0.005

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Jul 13, 2021	7 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Jul 13, 2021	7 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Jul 13, 2021	7 Days
BTEX - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Jul 13, 2021	14 Days
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Sydney	Jul 13, 2021	7 Days
Metals M8 filtered - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	Jul 13, 2021	28 Days
Volatile Organics - Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices	Sydney	Jul 13, 2021	7 Days

Australia

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Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254

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

Brisbane
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Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
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Welshpool WA 6106
Phone : +61 8 9251 9600
NATA # 1261
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PO Box 60 Wickham 2293
Phone : +61 2 4968 8448
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Rolleston, Christchurch 7675
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IANZ # 1290

Company Name:	Cavvanba Consulting	Order No.:	20025.76	Received:	Jul 13, 2021 4:00 PM
Address:	1 / 66 Centennial Cct Byron Bay NSW 2481	Report #:	810223	Due:	Jul 20, 2021
Project Name:		Phone:	02 6685 7811	Priority:	5 Day
Project ID:	20025.76	Fax:	02 6685 5083	Contact Name:	Drew Wood

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Lead	Volatlie Organics	Moisture Set	Eurofins Suite B7 (filtered metals)
Melbourne Laboratory - NATA Site # 1254									
Sydney Laboratory - NATA Site # 18217						X	X	X	X
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
Mayfield Laboratory - NATA Site # 25079									
External Laboratory									
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID				
1	QS02	Jul 06, 2021		Soil	S21-JI23672	X		X	
2	QS04	Jul 06, 2021		Soil	S21-JI23673	X		X	
3	QS06	Jul 06, 2021		Soil	S21-JI23674	X		X	
4	QW02	Jul 04, 2021		Water	S21-JI23675		X		X
Test Counts						3	1	3	1

Internal Quality Control Review and Glossary
General

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

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons							
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	
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							
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							
Volatile Organics							
1.1-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.1-Dichloroethene	mg/L	< 0.001			0.001	Pass	
1.1.1-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.1.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dibromoethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.2-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.3-Trichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.4-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.3.5-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.4-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
2-Butanone (MEK)	mg/L	< 0.001			0.001	Pass	
2-Propanone (Acetone)	mg/L	< 0.001			0.001	Pass	
4-Chlorotoluene	mg/L	< 0.001			0.001	Pass	
4-Methyl-2-pentanone (MIBK)	mg/L	< 0.001			0.001	Pass	
Allyl chloride	mg/L	< 0.001			0.001	Pass	
Bromobenzene	mg/L	< 0.001			0.001	Pass	
Bromochloromethane	mg/L	< 0.001			0.001	Pass	
Bromodichloromethane	mg/L	< 0.001			0.001	Pass	
Bromoform	mg/L	< 0.001			0.001	Pass	
Bromomethane	mg/L	< 0.001			0.001	Pass	
Carbon disulfide	mg/L	< 0.001			0.001	Pass	
Carbon Tetrachloride	mg/L	< 0.001			0.001	Pass	
Chlorobenzene	mg/L	< 0.001			0.001	Pass	
Chloroethane	mg/L	< 0.001			0.001	Pass	
Chloroform	mg/L	< 0.005			0.005	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Chloromethane	mg/L	< 0.001			0.001	Pass	
cis-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
cis-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Dibromochloromethane	mg/L	< 0.001			0.001	Pass	
Dibromomethane	mg/L	< 0.001			0.001	Pass	
Dichlorodifluoromethane	mg/L	< 0.001			0.001	Pass	
Iodomethane	mg/L	< 0.001			0.001	Pass	
Isopropyl benzene (Cumene)	mg/L	< 0.001			0.001	Pass	
Methylene Chloride	mg/L	< 0.001			0.001	Pass	
Styrene	mg/L	< 0.001			0.001	Pass	
Tetrachloroethene	mg/L	< 0.001			0.001	Pass	
trans-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
trans-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Trichloroethene	mg/L	< 0.001			0.001	Pass	
Trichlorofluoromethane	mg/L	< 0.001			0.001	Pass	
Vinyl chloride	mg/L	< 0.001			0.001	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							
TRH C6-C9	%	75			70-130	Pass	
TRH C10-C14	%	92			70-130	Pass	
Naphthalene	%	92			70-130	Pass	
TRH C6-C10	%	78			70-130	Pass	
TRH >C10-C16	%	94			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	93			70-130	Pass	

Test	Units	Result 1	Acceptance Limits	Pass Limits	Qualifying Code		
Toluene	%	93	70-130	Pass			
Ethylbenzene	%	97	70-130	Pass			
m&p-Xylenes	%	96	70-130	Pass			
o-Xylene	%	98	70-130	Pass			
Xylenes - Total*	%	97	70-130	Pass			
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethene	%	97	70-130	Pass			
1.1.1-Trichloroethane	%	98	70-130	Pass			
1.2-Dichlorobenzene	%	95	70-130	Pass			
1.2-Dichloroethane	%	101	70-130	Pass			
Trichloroethene	%	102	70-130	Pass			
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	128	70-130	Pass			
Acenaphthylene	%	76	70-130	Pass			
Anthracene	%	127	70-130	Pass			
Benz(a)anthracene	%	120	70-130	Pass			
Benzo(a)pyrene	%	112	70-130	Pass			
Benzo(b&j)fluoranthene	%	105	70-130	Pass			
Benzo(g,h,i)perylene	%	108	70-130	Pass			
Benzo(k)fluoranthene	%	108	70-130	Pass			
Chrysene	%	129	70-130	Pass			
Dibenz(a,h)anthracene	%	101	70-130	Pass			
Fluoranthene	%	115	70-130	Pass			
Fluorene	%	108	70-130	Pass			
Indeno(1,2,3-cd)pyrene	%	102	70-130	Pass			
Phenanthrene	%	98	70-130	Pass			
Pyrene	%	127	70-130	Pass			
LCS - % Recovery							
Heavy Metals							
Arsenic (filtered)	%	102	80-120	Pass			
Cadmium (filtered)	%	111	80-120	Pass			
Chromium (filtered)	%	99	80-120	Pass			
Copper (filtered)	%	98	80-120	Pass			
Lead (filtered)	%	97	80-120	Pass			
Mercury (filtered)	%	103	80-120	Pass			
Nickel (filtered)	%	99	80-120	Pass			
Zinc (filtered)	%	101	80-120	Pass			
Test	Lab Sample ID	QA Source	Units	Result 1	Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery							
Total Recoverable Hydrocarbons				Result 1			
TRH C6-C9	S21-JI21309	NCP	%	88	70-130	Pass	
TRH C10-C14	S21-JI21663	NCP	%	123	70-130	Pass	
Naphthalene	S21-JI21309	NCP	%	92	70-130	Pass	
TRH C6-C10	S21-JI21309	NCP	%	85	70-130	Pass	
TRH >C10-C16	S21-JI21663	NCP	%	120	70-130	Pass	
Spike - % Recovery							
BTEX				Result 1			
Benzene	S21-JI21309	NCP	%	116	70-130	Pass	
Toluene	S21-JI21309	NCP	%	107	70-130	Pass	
Ethylbenzene	S21-JI21309	NCP	%	103	70-130	Pass	
m&p-Xylenes	S21-JI21309	NCP	%	106	70-130	Pass	
o-Xylene	S21-JI21309	NCP	%	104	70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Xylenes - Total*	S21-JI21309	NCP	%	105			70-130	Pass	
Spike - % Recovery									
Volatile Organics				Result 1					
1.1-Dichloroethane	S21-JI21309	NCP	%	107			70-130	Pass	
1.1.1-Trichloroethane	S21-JI21309	NCP	%	101			70-130	Pass	
1.2-Dichlorobenzene	S21-JI21309	NCP	%	94			70-130	Pass	
1.2-Dichloroethane	S21-JI21309	NCP	%	106			70-130	Pass	
Trichloroethene	S21-JI21309	NCP	%	101			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	S21-JI31490	NCP	%	101			75-125	Pass	
Cadmium (filtered)	S21-JI31490	NCP	%	108			75-125	Pass	
Chromium (filtered)	S21-JI31490	NCP	%	95			75-125	Pass	
Copper (filtered)	S21-JI31490	NCP	%	95			75-125	Pass	
Lead (filtered)	S21-JI31490	NCP	%	94			75-125	Pass	
Mercury (filtered)	S21-JI31490	NCP	%	103			75-125	Pass	
Nickel (filtered)	S21-JI31490	NCP	%	95			75-125	Pass	
Zinc (filtered)	S21-JI31490	NCP	%	110			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	S21-JI24070	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	S21-JI26447	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	S21-JI26447	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	S21-JI26447	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Naphthalene	S21-JI24070	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	S21-JI24070	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH >C10-C16	S21-JI26447	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	S21-JI26447	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	S21-JI26447	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S21-JI24070	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	S21-JI24070	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.1-Dichloroethane	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1-Dichloroethene	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.1-Trichloroethane	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.2-Trichloroethane	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.2.2-Tetrachloroethane	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dibromoethane	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dichlorobenzene	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dichloroethane	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dichloropropane	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2.3-Trichloropropane	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2.4-Trimethylbenzene	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.3-Dichlorobenzene	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.3-Dichloropropane	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

Duplicate								
Volatile Organics				Result 1	Result 2	RPD		
1.3.5-Trimethylbenzene	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
1.4-Dichlorobenzene	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
2-Butanone (MEK)	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
2-Propanone (Acetone)	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
4-Chlorotoluene	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
4-Methyl-2-pentanone (MIBK)	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Allyl chloride	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Bromobenzene	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Bromochloromethane	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Bromodichloromethane	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Bromoform	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Bromomethane	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Carbon disulfide	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Carbon Tetrachloride	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Chlorobenzene	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Chloroethane	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Chloroform	S21-JI24070	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass
Chloromethane	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
cis-1.2-Dichloroethene	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
cis-1.3-Dichloropropene	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Dibromochloromethane	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Dibromomethane	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Dichlorodifluoromethane	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Iodomethane	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Isopropyl benzene (Cumene)	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Methylene Chloride	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Styrene	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Tetrachloroethene	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
trans-1.2-Dichloroethene	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
trans-1.3-Dichloropropene	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Trichloroethene	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Trichlorofluoromethane	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Vinyl chloride	S21-JI24070	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic (filtered)	S21-JI31489	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Cadmium (filtered)	S21-JI31489	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass
Chromium (filtered)	S21-JI31489	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Copper (filtered)	S21-JI31489	NCP	mg/L	0.003	0.003	2.0	30%	Pass
Lead (filtered)	S21-JI31489	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Mercury (filtered)	S21-JI31489	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Nickel (filtered)	S21-JI31489	NCP	mg/L	0.001	0.001	2.0	30%	Pass
Zinc (filtered)	S21-JI31489	NCP	mg/L	0.008	0.008	<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:

Emma Beesley	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
John Nguyen	Senior Analyst-Metal (NSW)
Roopesh Rangarajan	Senior Analyst-Volatile (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](#).

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IANZ # 1290

Company Name: Cavvanba Consulting
Address: 1 / 66 Centennial Cct
Byron Bay
NSW 2481

Order No.: 20025.76
Report #: 810223
Phone: 02 6685 7811
Fax: 02 6685 5083

Received: Jul 13, 2021 4:00 PM
Due: Jul 20, 2021
Priority: 5 Day
Contact Name: Drew Wood

Project Name:
Project ID: 20025.76

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Lead	Volatlie Organics	Moisture Set	Eurofins Suite B7 (filtered metals)
Melbourne Laboratory - NATA Site # 1254									
Sydney Laboratory - NATA Site # 18217						X	X	X	X
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
Mayfield Laboratory - NATA Site # 25079									
External Laboratory									
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID				
1	QS02	Jul 06, 2021		Soil	S21-JI23672	X		X	
2	QS04	Jul 06, 2021		Soil	S21-JI23673	X		X	
3	QS06	Jul 06, 2021		Soil	S21-JI23674	X		X	
4	QW02	Jul 04, 2021		Water	S21-JI23675		X		X
Test Counts						3	1	3	1

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Site # 23736

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IANZ # 1327

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

Sample Receipt Advice

Company name: Cavvanba Consulting
Contact name: Drew Wood
Project name: Not provided
Project ID: 20025.76
Turnaround time: 5 Day
Date/Time received: Jul 13, 2021 4:00 PM
Eurofins reference: 810223

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ Sample Temperature of a random sample selected from the batch as recorded by Eurofins Sample Receipt : 6.5 degrees Celsius.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- ✓ Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✗ Split sample sent to requested external lab.
- ✗ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Contact

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

Andrew Black on phone : (+61) 2 9900 8490 or by email: AndrewBlack@eurofins.com

Results will be delivered electronically via email to Drew Wood - drew@cavvanba.com.

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