Douglas Partners
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Report on
Detailed Site Investigation (Contamination)

Proposed Multistorey Building Redevelopment
2-8a Lee Street, Haymarket

Prepared for
Toga Development and Construction Pty Ltd

Project 86884.05
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Douglas Partners
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The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

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Executive Summary

This Detailed Site Investigation (DSI) has been prepared by Douglas Partners Pty Ltd (DP) to accompany a detailed State Significant Development (SSD) Development Application (DA) for the mixed-use redevelopment proposal at TOGA Central, located at 2-8a Lee Street, Haymarket (the Site). The Site is legally described as Lot 30 in Deposited Plan 880518 and Lot 13 in Deposited Plan 1062447. The site is also described as 'Site C' within the Western Gateway sub-precinct at the Central Precinct.

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued for the SSD DA (SSD 33258337).

This report concludes that the proposed mixed-use redevelopment is suitable subject to the implementation of the following mitigation measures.

- Implementation of actions outlined in the Remediation Action Plan (RAP) (86884.05.R.003.Rev0) to render the Site suitable for the proposed development. Significant contamination identified during the remediation (including unexpected finds) may warrant an amendment or addendum to the RAP such that appropriate actions are managed and documented;
- Intrusive investigations (sampling and testing) within the footprints of the Adina Hotel, the Lee Street pedestrian tunnel and the containment cell in Henry Deane Plaza (currently occupied by tenanted retail spaces, this investigation can only occur post-approval once the building has been demolished) (See Drawing D.002 for proposed test locations). Further information on additional sampling recommendations, including sampling locations and rationale, is to be provided in the Remediation Action Plan (86884.05.R.003.Rev0);
- Following demolition works, additional investigation (site walkover, sampling and testing) of the footprints of any demolition works to prevent cross-contaminating the subsurface soils with hazardous building material such as asbestos;
- Following demolition works, additional soil sampling and testing, either using *in situ* or *ex situ* sampling methods, to provide a final waste classification for surplus soils requiring off-site disposal during the excavation stage of the project; and
- Further investigation of groundwater particularly to assess the presence of both dissolved and total metals across the Site prior to and during dewatering. It is also noted that a groundwater management plan is likely to be required as part of the application for a dewatering license.

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Report on Detailed Site Investigation (Contamination)
Proposed Multistorey Building Redevelopment
2-8a Lee Street, Haymarket

1. Introduction

1.1 General

Douglas Partners Pty Ltd (DP) has been engaged by Toga Development and Construction Pty Ltd to complete this Detailed Site Investigation (Contamination) (DSI) in accordance with the technical requirements of the Secretary's Environmental Assessment Requirements (SEARs), and in support of the SSD DA (SSD 33258337) for a mixed-use redevelopment proposal at TOGA Central, located at 2- 8a Lee Street, Haymarket. The Site is shown on Drawing 1, Appendix B.

"The Minister for Planning, or their delegate, is the consent authority for the SSD DA and this application is lodged with the NSW Department of Planning and Environment (DPE) for assessment.

The purpose of the SSD DA is to complete the restoration of the heritage-listed building on the site, delivery of new commercial floorspace and public realm improvements that will contribute to the realisation of the Government's vision for an iconic technology precinct and transport gateway. The application seeks consent for the conservation, refurbishment and adaptive re-use of the Adina Hotel building (also referred to as the former Parcel Post building (fPPb)), construction of a 45-storey tower above and adjacent to the existing building and delivery of significant public domain improvements at street level, lower ground level and within Henry Deane Plaza. Specifically, the SSD DA seeks development consent for:

- Site establishment and removal of landscaping within Henry Deane Plaza.
- Demolition of contemporary additions to the fPPb and public domain elements within Henry Deane Plaza.
- Conservation work and alterations to the fPPb for retail premises, commercial premises, and hotel and motel accommodation. The adaptive reuse of the building will seek to accommodate:
  - Commercial lobby and hotel concierge facilities,
  - Retail tenancies including food and drink tenancies and convenience retail with back of house areas,
  - 4 levels of co-working space,
  - Function and conference area with access to level 7 outdoor rooftop space, and
  - Reinstatement of the original fPPb roof pitch form in a contemporary terracotta materiality.
- Provision of retail floor space including a supermarket tenancy, smaller retail tenancies, and back of house areas below Henry Deane Plaza (at basement level 1 (RL12.10) and lower ground (RL 16)).

- Construction of a 45-storey hotel and commercial office tower above and adjacent to the fPPb. The tower will have a maximum building height of RL 202.28m, and comprise:
  - 10 levels of hotel facilities between Level 10 - Level 19 of the tower including 204 hotel keys and 2 levels of amenities including a pool, gymnasium and day spa to operate ancillary to the hotel premises. A glazed atrium and hotel arrival is accommodated adjacent to the fPPb, accessible from Lee Street.
  - 22 levels of commercial office space between : Level 23 - Level 44 of the tower accommodated within a connected floor plate with a consolidated side core.
  - Rooftop plant, lift overrun, servicing and BMU.
- Provision of vehicular access into the Site via a shared basement, with connection points provided to both Block A (at RL 5) and Block B (at RL5.5) basements. Primary access will be accommodated from the adjacent Atlassian site at 8-10 Lee Street, Haymarket, into 4 basement levels in a split-level arrangement. The basement will accommodate:
  - Car parking for 106 vehicles, 4 car share spaces and 5 loading bays.
  - Hotel, commercial and retail and waste storage areas.
  - Plant, utilities and servicing.
- Provision of end of trip facilities and 165 employee bicycle spaces within the fPPb basement, and an additional 72 visitor bicycle spaces within the public realm.
- Delivery of a revitalised public realm across the Site that is coordinated with adjacent development, including an improved public plaza linking Railway Square (Lee Street), and Block B (known as 'Central Place Sydney'). The proposal includes the delivery of a significant area of new publicly accessible open space at street level, lower ground level, and at Henry Deane Plaza, including the following proposed elements:
  - Provision of equitable access within Henry Deane Plaza including stairways and a publicly accessible lift.
  - Construction of raised planters and terraced seating within Henry Deane Plaza.
  - Landscaping works within Henry Deane Plaza.
- Utilities and service provision.
- Realignment of lot boundaries.

The detailed development plan drawings are incorporated in Bates Smart Pty Ltd, SSDA Drawings, Project No. S12550.

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 17 December 2021 and issued for the SSD DA." [1]

[1]The text inside the quotation mark is sourced from Urbis Memo re: *TOGA Central SSD DA Consultant Reports - Mandatory Inclusions.*

Specifically, this report has been prepared to respond to the SEARs requirement issued below.

SEARs	Report Reference
18. Contamination and Remediation: *In accordance with SEPP 55, assess and quantify any soil and groundwater contamination and demonstrate that the site is suitable (or will be suitable, after remediation) for the development.*	• Preliminary Site Investigation (Summarised in Section 6.1 of this report); • If required: Detailed Site Investigation (Sections 9-11); and • Remedial Action Plan (Provided within a separate report prepared by Douglas Partners Ref: 86884.05. R.003.Rev0).

In addition to the above table, the SEARs require a Preliminary Long-term Environmental Management Plan. It is noted that the management plan is not required at this stage. It will be provided following the detailed design.

The DSI was undertaken in accordance with DP's proposal SYD201237 dated 27 January 2021.

The objectives of the DSI are to:

- Assess the suitability of the Site, from a contamination perspective, for the proposed commercial development; and
- Make recommendations for further investigations and / or remediation (if required) to render the Site suitable for the intended commercial development.

The assessment process, including approval of this DSI, is subject to a Site Audit by a NSW Environment Protection Authority (EPA) accredited Site Auditor, Mr Rod Harwood of Harwood Environmental Consultants Pty Ltd, under part 4 of the *Contaminated Land Management (CLM) Act* 1997).

This DSI has been conducted with reference to guidelines made or endorsed by the NSW Environment Protection Authority under the *Contaminated Land Management Act* 1997 (NSW EPA, 1997) including in particular the National Environment Protection Council *National Environment Protection (Assessment of Site Contamination) Measure* 1999 (amended 2013, NEPC 2013).

This report must be read in conjunction with all appendices including the notes provided in Appendix A.

1.2 Site Description[2]

The Site is located within the City of Sydney Local Government Area (LGA). The Site is situated 1.5 km south of the Sydney CBD and 6.9 km north-east of the Sydney International Airport within the suburb of Haymarket.

[2]The site description (section1.2) is sourced from Urbis Memo re: *TOGA Central SSD DA Consultant Reports - Mandatory Inclusions.*

The Site is located within the Western Gateway sub-precinct, an area of approximately 1.65 ha that is located immediately west of Central Station within Haymarket on the southern fringe of the Sydney CBD. Immediately north of Central Station is Belmore Park, to the west is Haymarket (including the University of Technology, Sydney and Chinatown), to the south and east is rail lines and services and Prince Alfred Park and to the east is Elizabeth Street and Surry Hills.

Central Station is a public landmark, heritage building, and the largest transport interchange in NSW. With regional and suburban train services, connections to light rail, bus networks and to Sydney Airport, the area around Central Station is one of the most-connected destinations in Australia.

The Site is located at 2 & 8A Lee Street, Haymarket and is legally described as Lot 30 in Deposited Plan 880518, Lot 13 in Deposited Plan 1062447 and part of Lot 14 in Deposited Plan 1062447.

The land that comprises the Site under the Proponent's control (either wholly or limited in either height or depth) comprises a total area of approximately **4,159sqm**.

The location of the TOGA Central site is illustrated in **Figure 1**.

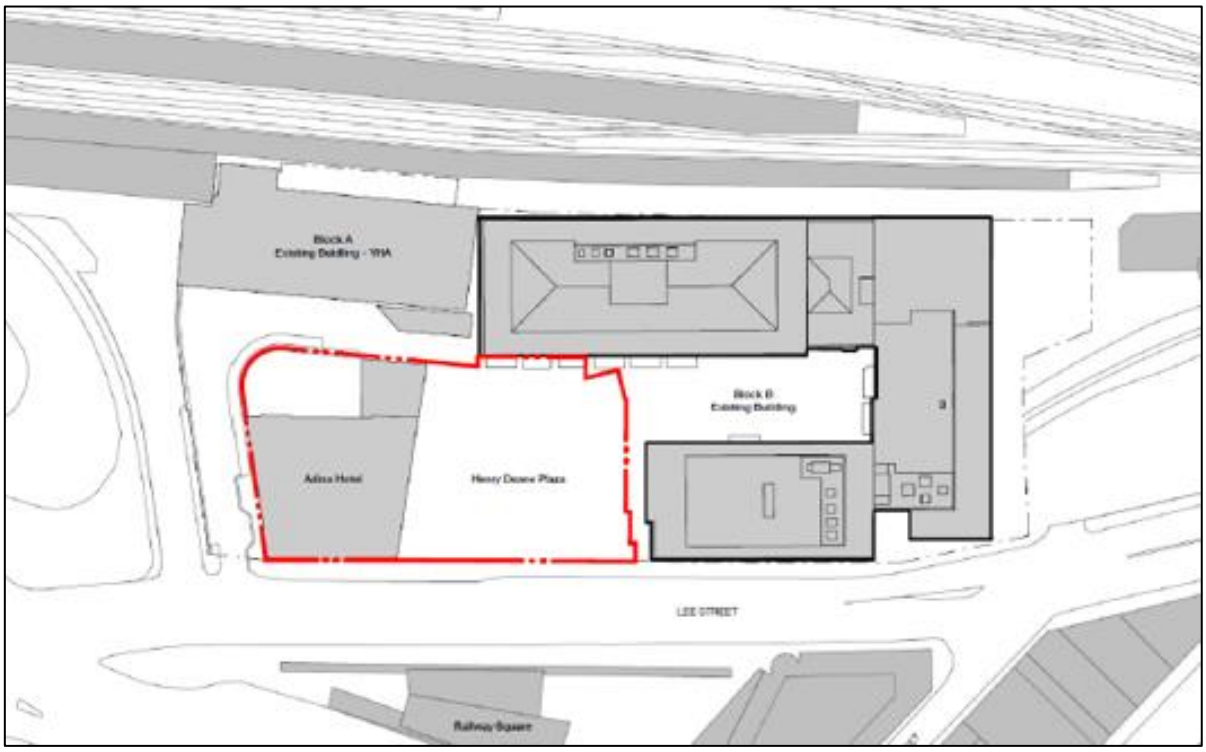


Figure 1: Site Identification Plan (sourced from Bates Smart)

The Site currently comprises the following existing development:

- Lot 30 in Deposited Plan 880518 (Adina Hotel building): the north-western lot within the Western Gateway sub-precinct accommodates a heritage-listed building which was originally developed as the Parcels Post Office building. The building has been adaptively re-used and is currently occupied by the Adina Hotel Sydney Central. The eight-storey building provides 98 short-stay visitor apartments and studio rooms with ancillary facilities including a swimming pool and outdoor seating at the rear of the Site.

- Lot 13 in Deposited Plan 1062447 and part of Lot 14 in Deposited Plan 1062447 (Henry Deane Plaza): the central lot within the Western Gateway sub-precinct adjoins Lot 30 to the south. It accommodates 22 specialty food and beverage, convenience retail and commercial service tenancies. The lot also includes publicly accessible space which is used for pop-up events and a pedestrian thoroughfare from Central Station via the Devonshire Street Tunnel. At the entrance to Devonshire Street Tunnel is a large public sculpture and a glazed structure covers the walkway leading into Railway Square. This area forms part of the busy pedestrian connection from Central Station to Railway Square and on to George and Pitt Streets, and pedestrian subways.

The Site is listed as an item of local significance under Schedule 5 of the Sydney Local Environmental Plan 2012 'Former Parcels Post Office including retaining wall, early lamp post and building interior', Item 855.

The Site is also included within the Central Railway Station State heritage listing. This is listed on the State Heritage Register 'Sydney Terminal and Central Railway Station Group', Item SHR 01255, and in Schedule 5 of the Sydney Local Environmental Plan 2012 'Central Railway Station group including buildings, station yard, viaducts and building interiors' Item 824.

The Site is not however listed independently on the State Heritage Register. There is an array of built forms that constitute Central Station, however the Main Terminal Building (particularly the western frontage) and associated clocktower constitute key components in the visual setting of the Parcel Post building.

1.3 Site and Surrounding Area

The northern portion of the Site is occupied by the eight-storey Adina hotel building and the remainder of the Site consists of Henry Deane Plaza, an open space paved area surrounded by retail shops to the east and south, Adina Hotel and retail shops to the north, and steps leading up to Lee Street to the west. There is a fountain and seating areas within the Plaza, as well as a few mature trees.

The southern boundary of the Site extends to the rear of the retail stores (e.g., Priceline pharmacy) on the lower ground level, however, does not include the above stratum level. The eastern boundary, along the southern portion extends up to (but does not include) the retail stores, and along the central portion, includes the retails stores within the Devonshire Tunnel entrance. The eastern Site boundary extends further north, beyond the tunnel retail stores (i.e., beneath the level of the YHA building). The western site boundary fronts Lee Street and includes part of the Adina Hotel basement level, within the tunnel entrance.

To the east of the Adina building, there are steps leading up to the upper street level (i.e., entrance to the YHA building). It should be noted that the area to the east of the brick retaining wall, on the upper street level is not part of the Site. The passageway beneath the YHA building was observed to have concrete floors and some skip bins for rubbish. The area west of the brick retaining wall (upper street level) is part of the Adina building; and included a pool and landscaped areas.

The Adina building has a single level basement, a section of which is used as a car park.

A grease trap was observed within the north-western portion of the basement. One of the rooms in the basement is used as laundry with two large commercial washing machines and associated chemicals. The adjacent storage room is used to store various chemicals, likely cleaning / laundry products.

2. Scope of Work

The scope of works for the DSI comprised the following:

- A review of previous reports relevant to the proposed development and available to DP;
- Preparation of Safe Work Method Statements (SWMS) and Field Work Safety Environmental Plan (FWSEP);
- Completion of a Dial-Before-You-Dig (DBYD) underground services records search and scanning for underground services at sample locations;
- Drilling of twelve boreholes at the locations shown on Drawing 1 in Appendix B (Boreholes BH1001-BH1007, BH1003A, BH1004A, BH2001-BH2002, and BH2001A), and installation of groundwater monitoring wells into three of the boreholes (BH1002, BH1003A and BH1007) as part of the geotechnical investigation using hand tools and non-destructive digging vacuum excavation methods, then by a track-mounted drilling rig with auger, rotary drilling and NMLC coring techniques;
- Obtaining soil samples from ten boreholes (no soil samples were taken from BH1006 and BH2001 due to borehole refusal) at regular depth intervals based on field observations, upon signs of contamination and at changes in strata to approximately 0.5 m into natural soils or borehole termination (whichever is the lesser);
- Logging of encountered soil materials and pertinent field information;
- Screening of all samples collected with a photo-ionisation detector (PID) to measure the presence or absence of volatile organic compounds (VOC);
- Development of the monitoring wells (including three additional monitoring wells installed during previous DP investigations) following installation by removing a minimum of three well volumes or until all standing water was removed from the well;
- Collection of groundwater samples from six wells using a low-flow sampling pump. Measure and record physical parameters prior to sampling;
- Laboratory analysis of twenty-four (24) main soil samples at a NATA accredited laboratory for a combination the following common potential contaminants of concern:
    - Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc);
    - Polycyclic aromatic hydrocarbons (PAH);
    - BTEX (benzene, toluene, ethyl benzene, xylenes);
    - Total recoverable hydrocarbons (TRH);
    - Phenols;
    - Organochlorine pesticides (OCP);
    - Organophosphorus pesticides (OPP);
    - Polychlorinated biphenyl (PCB);

- Volatile Organic Compounds (VOC);
- Cyanide;
- pH;
- Cation Exchange Capacity (CEC);
- Ions;
- Hardness; and
- Asbestos.

- Quality Assurance / Quality Control (QA / QC) sampling and analysis, including inter-laboratory replicates, intra-laboratory replicates, trip spikes and trip blanks; and
- Preparation of this DSI report.

3. Site Identification and Description

Site Address	2-8a Lee Street, Haymarket
Legal Description	• Lot 13, Deposited Plan 1062447 (8a Lee Street, Haymarket); • Lot 30, Deposited Plan 877478 (2 Lee Street Haymarket); and • A portion of Lot 14 in DP1062447
Area	Approximately 4159 m^2
Zoning	B8 Metropolitan Centre
Local Council Area	City of Sydney
Surrounding Uses	• North: Ramp driveway to YHA hostel, Ambulance Avenue, bus bay, an open space area, Pitt Street and commercial (office) buildings; • East: YHA hostel, Central Station; • South: retail spaces in Henry Deane Plaza and three adjoining commercial buildings; and • West: Lee Street, Railway Square, George Street, commercial buildings.

At the time of field investigation, the Site was mainly divided into two areas: the 'Adina Hotel' to the north and the 'Henry Deane Plaza' to the south. Descriptions of the two areas of the Site are set out below:

- Northern area of the Site ('Adina Hotel'):
  - This area is occupied by an 8-level building, with a single basement level at an elevation of RL13.4 m which is partly occupied by retail space and partly by car parking spaces (accessed from Ambulance Avenue);
  - A brick retaining wall is visible on the eastern side of the car parking section of the basement, together with a concrete underpin which extends from below the brick retaining wall to either just above or to below the basement floor;

- Based on the provided drawing (prepared by Synman, Justin and Bialek Architects, Drawing WG.05, dated 21 March 1998), the basement floor level is at an elevation of RL13.4 m;
- A retail tenancy space occupies the southern part of the Adina Hotel footprint, with the floor level of this area at approximately the same level as that of the nearby Henry Deane Plaza. This retail space has both a concrete floor and 'roof', which is supported by circular concrete columns and beams;
- Above the 'roof' of the retail space is a ramp covered with stone tiles, which leads eastwards from the footpath of Lee Street down to the Devonshire Street pedestrian tunnel (i.e., it is a suspended slab); and
- There is an entrance into the retail space at the eastern portal of the Lee Street pedestrian tunnel (which passes beneath Lee Street, to 'Railway Square' further to the west), as well as an entrance on the eastern side of the Site into a nearby access corridor and storage area.

- Southern area of the Site ('Henry Deane Plaza'):
  - Most of the southern part of the Site is an open, tiled area which connects 'at-grade' with the Devonshire Street pedestrian tunnel to the east, up to Lee Street in the west (via either a ramp up or a single flight of steps), and down to the Lee Street tunnel via both a series of steps or a slightly sloped, tiled pedestrian ramp; and
  - Mature trees, a fountain, and a single-level retail tenancy are present on the southern side of the Plaza, which is connected to the neighbouring commercial development at a higher elevation to the south via a series of steps.

A glass roof covers the pedestrian route / ramp between the Devonshire Street pedestrian tunnel and the Lee Street tunnel.

4. Environmental Setting

Regional Topography	The overall regional topography appears to slope down towards north and west of the Site.
Site Topography	The Site topography varies from 14 m relative to the Australian height datum (AHD) to 20 m AHD as shown on published 2 m elevation contours.
Soil Landscape	Reference to the Sydney 1:100 000 Soils Landscape Sheet indicates the Site is underlain by the Blacktown soil landscape (mapping unit bt), characterised by gently undulating rises on Wianamatta Group shales and Hawkesbury shale, with local relief to 30 m and slopes usually less than 5%. The natural undeveloped landscape is typically represented by broad rounded crests and ridges with gently inclined slopes. Soils range from shallow (<1 m) red-brown podzolic soils - comprising mostly clayey soils on crests and upper slopes - to deep (1.5 - 3 m) yellow-brown clay soils on lower slopes and areas of poor drainage. These soils are typically moderately reactive with low fertility, poor soil drainage and highly plastic subsoil.

Geology	Reference to the Sydney 1:100 000 Geological Series Sheet indicates that the Site is underlain by Triassic age Ashfield Shale overlying Hawkesbury Sandstone, and that the Site is located near Quaternary age alluvial sediments, including transgressive dune sands. Although not specifically shown on the geological map, the Mittagong Formation is likely to be present at the transition between the Ashfield Shale and Hawkesbury Sandstone geological units. The Quaternary sediments typically comprise medium to fine grained sand. The Ashfield Shale typically comprises black to dark grey shales and laminite. The Mittagong Formation consists of interbedded shale, laminite and fine grained quartz sandstone, and the underlying Hawkesbury Sandstone typically comprises horizontally bedded and vertically jointed, massive and cross-bedded, medium grained quartz sandstone with a few shale interbeds. A former creek is shown on a plan from the year 1855 from the City of Sydney Archives. The Devonshire Street Pedestrian Tunnel is inferred to be aligned sub-parallel to and either co-incident with or adjacent to the former creek. The geological map indicates the possible presence of igneous dykes near to and north of the Site, striking in a north-westerly direction. These dykes are commonly steeply dipping (often near-vertical) slabs of igneous rock which intrude through the bedrock, with measured widths in the Greater Sydney Region ranging between a centimetre or less to about 6 m (Ref. 3). These dykes could be associated with zones of closely spaced fractures within high strength rock. Although no evidence of dykes was found in the investigation there is a possibility that a dyke could cross the Site. Site investigations during the present study encountered alluvial and residual soils, and sandstone bedrock consistent with the Mittagong Formation and Hawkesbury Sandstone.
Acid Sulfate Soils	Reference to the published Acid Sulfate Soils Mapping indicates that the Site lies in a “Class B” area, where there is a low probability of occurrence of acid sulfate soils. Furthermore, given that the Site lies at an elevation of approximately 14 to 20 m AHD, the probability of ASS being present on site is considered extremely unlikely. Further assessment of acid sulphate soil is not considered to be required.
Surface Water	Surface water is anticipated to drain to the local stormwater system and follow the general regional topography.

Groundwater	Groundwater is expected to flow in a north north-westerly direction towards Blackwattle Bay and Darling Harbour which is located approximately 1.1 km northwest of the Site. Inferred groundwater flow direction is shown on Drawing M1 in Appendix B. DP note that groundwater located in a shale profile can be saline in nature with elevated total dissolved solids. Review of the groundwater bore database maintained by the Department of Primary Industry indicates that there were 43 registered groundwater bores located to the southwest, within 500 m of the Site, however, standing water level (SWL) data only available for GW109500, GW109501, GW109502 and GW109503 with SWL at approximately 2.2 m to 2.3 m. The authorised purpose of the bores were reported to be for groundwater monitoring.

5. Site History

5.1 Site History

DP was commissioned by Toga Pty Ltd (Toga) to undertake a Preliminary Site (Contamination) Investigation (PSI) for the proposed commercial development at 2 and 8A Lee Street, Haymarket in 2020. The historical information for the Site and surrounding area was sourced from DP 2020.

Review of a historic map dated the year 1854 included in the Enviro-Screen report shows that the Site was occupied by Sydney Benevolent Asylum. Information obtained from the Sydney Benevolent Asylum website[3] indicates that the asylum was established in 1818 and was demolished in 1901 to make way for the current Central Station. The website states that the asylum backed on to the Old Sydney Burial Ground (Devonshire Street Cemetery).

An article on Central Railway Station written by Mark Dunn[4] was obtained through a search of *Trove, National Library of Australia.* The article indicates that construction work on the Central Railway Station commenced in June 1901, which corresponds to the year that the asylum was demolished. It is reported that the plan to construct Central Station required some major relocations including the cemetery, the Police Superintendent's residence in Pitt Street, Christ Church Parsonage, the Benevolent Society, the Police Barracks and some residential properties. The article states that material excavated from the Central Station site was used in the adjacent Prince Alfred and Belmore parks, and to form a ramp for an overhead tramway that approached the station from the city.

A building surveyors plan dated 1956 and a City of Sydney Planning Scheme map dated 1958 identifies the building located within the north-western portion of the Site as the Parcels Post Office and the shed along the southern boundary (observed in the 1930 to 1998 aerial - refer to Section 5.1) as a "carriage shed".

[3] http://www.sydneybenevolentasylum.com/index.php?page=what-was-the-sydney-benevolent-asylum
[4] https://dictionaryofsydney.org/entry/central_railway_station#ref-uuid=93db85ed-909c-1383-8ff9-5ccfa94cebd9

A historical title deeds dating back to 1855 were obtained for Lot 13, Deposited Plan 1062447 and Lot 30, Deposited Plan 877478. Review of the Title Deeds indicates that the Site was previously divided into three parts as shown on Figure 3 below. A summary of the Title Deeds, with reference to Figure 1 is provided below:

- Part tinted pink - Rail Corporation of New South Wales (formerly The Commissioners for Railways) were the registered proprietors of the land from 1855 to the present day; and
- Part tinted yellow and blue - Rail Corporation of New South Wales (formerly Railway Commissioners of New South Wales) were the registered proprietors of the land from 1901 to the present day.

Based on review of the Title Deeds, and together with the historical aerial photographs, it is inferred that the land use was commercial since 1855. It is noted that Toga Pty Ltd are the head lessee of the Leasehold title.

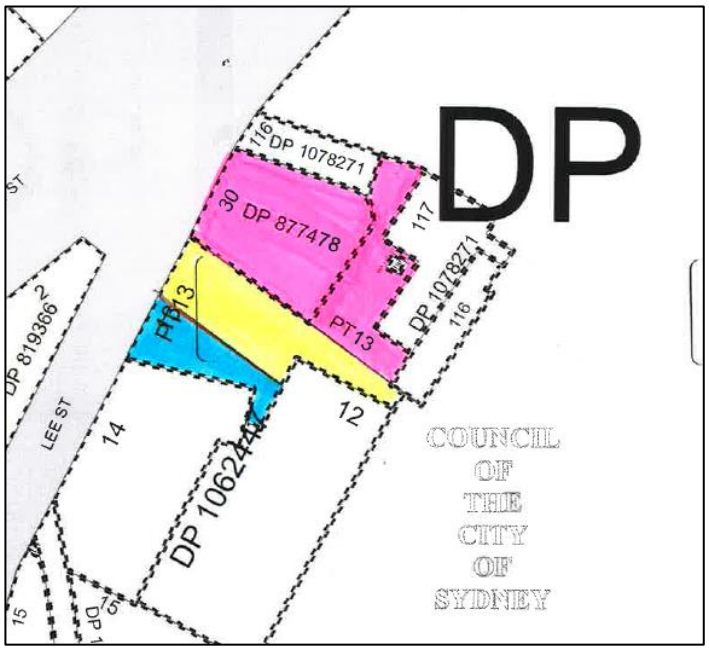


Figure 2: Cadastral Map, extracted from Title Deeds Report in DP 2020

5.2 NSW EPA Public Register

The EPA maintains a public database of contaminated sites under Section 58 of the CLM Act. The notices relate to investigation and / or remediation of site contamination considered to be significantly contaminated under the definition in the CLM Act.

Based on review of the Enviro-Screen report from DP 2020, the following is indicated:

- No notices or orders made under the CLM Act have been issued for the Site or adjacent properties;

- The Site has not been included in the list of NSW contaminated sites notified to EPA. However, the following sites located within 500 m of the Site have been notified as being contaminated to the NSW EPA:
  - Frasers Development, located approximately 270 m south-west of the Site is currently under assessment by the EPA; and
  - Ausgrid Road Reserve, located approximately 490 m north east of the Site is listed, however, it is noted that regulation under the CLM Act is not required.
- No licences under Schedule 1 of the POEO Act have been issued for the Site. However, it is noted that a licence for 'railway systems activities' has been issued for Laing O'Rourke Australia Construction Pty Ltd, Downer EDI Works Pty Ltd and Sydney Trains located immediately east of the Site. A penalty notice has been issued to Central Station for the fee-based activity, "deposit litter";
- No records were found relating to defence sites, James Hardie Asbestos Waste Contamination legacy sites, waste management facilities or sites that are part of the PFAS investigation program, within 500 m of the Site. It is noted that a former gasworks site, the Australian Gaslight Yard Co, is located approximately 300 m north-east of the Site and
- A former potentially contaminating activity (unknown name repair facility) is understood to be located within 50 m south-west of the Site. It is noted that a current potentially contaminating activity, Europcar - Sydney Central (rental car facility) is located approximately 60 m south-west of the site.

6. Previous Reports

The following relevant reports were available for review:

The Site:

- *DP Report on Preliminary Site (Contamination) Investigation, Proposed Multistorey Building Redevelopment,* 2 & 8A Lee Street, Haymarket, Reference: 86884.01.R.001.Rev1, dated February 2020 (DP 2020).

Nearby Sites:

- *Environmental Resources Management Pty Ltd (ERM), Environmental Management Plan (EMP),* Henry Deane Park, Lee Street, Sydney, Reference: 98252RP9-EMP (ERM 2001); and
- *JBS&G Australia Pty Ltd, Data Gap Investigation, 14 to 30 Lee Street, Haymarket,* Reference: 59064 - 129805 (Rev1) (JBS&G 2021).

6.1 DP 2020

DP was commissioned by Toga Pty Ltd (Toga) to undertake a Preliminary Site (Contamination) Investigation (PSI) for the proposed commercial development at 2 and 8A Lee Street, Haymarket in 2020 to provide an indication of the risk and nature of potential contamination at the Site. The PSI comprised a review of site history information, a site walkover, and development of a preliminary conceptual site model (PCSM). The intrusive investigations were not undertaken as part of this PSI.

Based on the review of the site history information, it is evident that the Site and surrounds have been used largely for commercial land use since the 1800s. The Site was occupied by Benevolent Asylum, likely from the early 1800s until the building was demolished in 1901 - the year that construction works commenced on Central Station, located to the east of the Site. The Carriage Shed, formerly located within the southern portion of the Site, and likely constructed in the early 1900s was also subsequently demolished. Considering the age of the former structures, it is considered possible that hazardous building materials were used in the buildings. The demolition of the structures could therefore impact the area, especially if the demolition practices were poorly controlled.

In around 1911 to 1912, construction of the Parcels Post Office commenced, the heritage-listed building that currently occupies the north-western portion of the Site. The building is currently in use as Adina hotel. Given the current use as a hotel and the laundry / cleaning activities undertaken in the basement level, along with the retail stores that occupy Henry Deane Plaza, the current Site uses are considered to be a potential source of contamination, primarily through the groundwater pathway.

Based on review of the borehole logs in the vicinity of the Site, it is likely that fill has been placed on the Site, used for historical levelling purposes. Furthermore, it is considered possible that material excavated from Central Station during the construction stage, was used as fill at the Site. Off-site contamination from Central Station, located up-gradient to the Site is also considered to be a potential source of contamination to the Site, primarily though the groundwater pathway.

Overall, based on the site history information, the Site is considered to pose a moderate risk of contamination and the following assessments were recommended prior to development to confirm the contamination status of the Site:

- An intrusive soil and groundwater investigation should be conducted to assess the potential for contamination at the Site; and
- A pre-demolition hazardous building material survey[5] in accordance with SafeWork NSW requirements was recommended to be conducted by an appropriately qualified occupational hygienist prior to the demolition of the existing structures. All demolition work should be undertaken by a licenced demolition contractor and a clearance certificate provided by an occupational hygienist for the ground surface post demolition.

[5] DP noted that a Hazmat Survey has been prepared by SLR Consulting Australia Pty Ltd to accompany the SSA DA (the report was not provided to DP by the time of issuing this DSI report)

6.2 ERM 2001

Henry Deane Park site (HDP site) is located on Lee Street in Sydney (to the south-west of the subject site). The Site was part of the Central Station Complex which consisted of the former railway yards and a maintenance shed. In the past, the Site and surrounding area was extensively filled and levelled to enable construction of Station platforms in 1880 and sheds in 1908. The main use of the HDP site was for the cleaning of railway carriages between 1855 and the 1960s.

CMPS&F and ERM prepared a series of contamination reports for the HDP site. The contaminants of concern analysed included: heavy metals, TRH, BTEX, VOC and OCP. Lead and PAH concentrations were detected in all soil samples from the borehole locations, several of these samples exceeded the HIL (1996) criteria[6] for PAH.

A cap and contain method for the containment of PAH and lead impacted soils was adopted at the time. The containment cell comprises of sandstone bedrock with stiff impermeable clay walls and base. The upper seal is the concrete slab of the development at the time. Below the slab is a marker horizon of sand several hundred mm thick. The boundary of the containment cell is depicted on Drawing 2 in Appendix B.

The vertical extent of the cell is anticipated to be between 2.6 m and 4 m thick with clay barrier walls and base and a sand marker layer (several hundred mm thick) below the concrete slab.

In the case of a partial breach in the clay barrier wall, this should be repaired with clay of similar composition and properties. If the concrete slab is breached it should be replaced and the sand marker layer below it reinstated. The cell should be subjected to moisture content tests and compaction tests (98%) and where possible permeability tests.

It should be noted that part of the containment cell is within this current investigation site as shown in Drawing 2 in Appendix B.

6.3 JBS&G 2021

JBS&G prepared a data gap (contamination) investigation at 14-30 Lee Street, Haymarket (to the south-west of the subject site). The scope of JBS&G (2021) investigation included collection and analysis of soil samples from 9 (nine) targeted boreholes across the neighbouring site. Two of the boreholes were converted into groundwater wells.

The soil samples were analysed for: heavy metals, PAH, TRH, BTEX, TOC, VOC, PCB, PFAS and asbestos. The groundwater samples were analysed for: heavy metals, PAH, TRH, BTEX, VOC and PFAS.

[6] Superseded by *NEPC National Environment Protection (Assessment of Site Contamination) Measure 1999* (as amended 2013) (NEPC, 2013)

The soil, groundwater and soil vapour investigations (including JBS&G 2019[7]) investigation did not identify any contamination at concentrations which would pose an unacceptable risk to human health or the ecology under a commercial/industrial land use scenario. The neighbouring site is considered suitable for the proposed development without remediation and site management subject to decommissioning of the known underground storage tanks (USTs).

Marginal copper and zinc exceedances were detected in groundwater sample (upgradient well), these reported concentrations were, however, considered to be typical background levels of localised groundwater. Groundwater is likely to be suitable for discharge to stormwater subject to treatment of groundwater for turbidity and pH.

Fill materials across the neighbouring site (including within the containment cell) are classified as general solid waste (non-putrescible). Natural soil materials in proximity of the USTs may contain hydrocarbon impacts, further sampling / analysis will be required.

An unexpected finds protocol (UFP) is recommended for the Site to guide appropriate actions during development in the event of unexpected finds of contamination.

It should be noted that JBS&G 2021 was conducted for the adjacent Site of this DSI therefore it has limited applicability to conditions within the current Site. However, two samples HA02 and HA03 from JBS&G collected from planter bed soil were within current DSI Site and the results is included in this DSI.

7. Conceptual Site Model

A Conceptual Site Model (CSM) is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM provides the framework for identifying how the Site became contaminated and how potential receptors may be exposed to contamination either in the present or the future i.e., it enables an assessment of the potential source - pathway - receptor linkages (complete pathways).

Potential Sources

Based on the previous investigation reports reviewed, the following potential sources of contamination and associated contaminants of potential concern (COPC) have been identified and summarised in Table 1, below.

Table 1: Summary of Identified Potential Areas of Environmental Concern

Potential Source	Description of Potential Contaminating Activity	Contaminants of Potential Concern
Fill and surficial soil (S1)	It is likely that fill was placed at the site to achieve the design levels. As the source of fill is unknown, there is potential for contaminants to be present in the fill. Furthermore, the site history search identified that the former asylum and the Carriage Shed were demolished. The demolition / deterioration of the structures (likely to contain hazardous building materials) may over time have impacted the fill / soil.	Heavy metals, TPH, BTEX, PAH, PCB, OCP, OPP, phenols and asbestos.
Hazardous building materials in existing structures (S2)	Considering the age of the existing structure, it is considered likely that hazardous building materials were used in construction. More recent additions to the building constructed after 1990 are considered unlikely to contain some hazardous building materials such as asbestos.	Asbestos, lead and PCB, SMF[1].
Current Site Uses (S3)	The site is currently occupied by various retail stores and a hotel building. The basement of the hotel building was used for laundry services associated with the hotel operation. Various cleaning chemicals were stored in the basement and a grease trap was also observed.	Heavy metals, TPH, BTEX, PAH, VOC, VCH[2]
Previous and current offsite activities in the surrounding area (S4)	Central Station is located upgradient of the site, therefore, there is potential for contamination at the site from offsite sources.	Heavy metals, TPH, BTEX, PAH, VOC, per- and polyfluoroalkyl substances (PFAS) and cyanide
Containment Cell constructed in the late 1990s (S5)	Part of a historical containment cell, constructed in the late 1990s, appear to intersect the southern portion of the site, where the Henry Deane Plaza is located.	Lead, PAH and asbestos

Notes:

1. SMF will be assessed by visual inspection only.
2. VOC screening contaminant for VCH.

Potential Receptors

The following potential human receptors have been identified:

- R1: Future site users (site workers and visitors);
- R2: Construction and maintenance workers;
- R3: Adjacent site users (site workers and visitors);

- R4: Terrestrial ecology;
- R5: Surface water (Blackwattle Bay and Darling Harbour; brackish water);
- R6: Groundwater; and
- R7: In-ground structures.

Potential Pathways

The following potential pathways have been identified:

- P1: Direct contact.
- P2: Ingestion and dermal contact;
- P3: Inhalation of dust and / or vapours;
- P4: Surface water run-off;
- P5: Leaching of contaminants and vertical migration into groundwater; and
- P6: Lateral migration of groundwater providing base flow to water bodies.

A 'source - pathway - receptor' approach has been used to assess the potential risks of harm being caused to human or environmental receptors from contamination sources on or in the vicinity of the site, via exposure pathways (potential complete pathways). The potential source - pathway - receptor linkages considered to be applicable to the site, shown below in Table 2.

Table 2: Summary of Potentially Complete Exposure Pathways

Potential Source	Transport Pathway	Receptor
S1 to S5 COPC: Heavy metals, TPH, BTEX, PAH, PCB, OCP, OPP, phenols, VOC, cyanide and asbestos.	(P1) Direct contact (P2) Ingestion and dermal contact	(R1) Future site users (R2) Construction and maintenance workers
	(P3) Inhalation of dust and / or vapours	(R1) Future site users (R2) Construction and maintenance workers (R3) Adjacent site users
	(P4) Surface water run off (P6) Lateral migration of groundwater	(R5) Surface water
	(P5) Leaching and vertical migration into groundwater	(R6) Groundwater
	(P1) Direct contact	(R4) Terrestrial ecology
	(P1) Direct contact	(R7) In-ground structures

8. Field Rationale and Methods

8.1 Data Quality Objectives

This DSI has been devised in general accordance with the seven-step Data Quality Objective (DQO) process which is provided in Appendix B, Schedule B2 of NEPC (2013). The DQO process is outlined as follows:

- State the problem;
- Identify the decision;
- Identify inputs into the decision;
- Define the boundary of the assessment;
- Develop a decision rule;
- Specify acceptable limits on decision errors; and
- Optimise the design for obtaining data.

Referenced sections for the respective DQOs listed above are provided in Appendix G.

8.2 Data Quality Indicators

The performance of the assessment in achieving the DQO was assessed through the application of Data Quality Indicators (DQI) as defined by:

Precision:	A quantitative measure of the variability (reproducibility) of data;
Accuracy:	A quantitative measure of the closeness of reported data to the “true” value;
Representativeness:	The confidence (expressed qualitatively) that data are representative of each media present on the site;
Completeness:	A measure of the useable data from a data collection activity; and
Comparability:	The confidence (expressed qualitatively) that data can be considered equivalent for each sampling and analytical event.

Further comments on the DQIs are presented in Appendix G.

8.3 Soil Sampling Locations and Rationale

Based on the CSM and data quality objectives (DQO) the following sampling rationale was adopted.

A systematic sampling strategy based on NSW EPA Contaminated Sites, Sampling Design Guidelines (NSW EPA, 1995) to determine borehole locations was adapted based on areas of access. Borehole locations are shown on Drawing 1, in Appendix B.

Table A of NSW EPA (1995) recommends a minimum of 11-12 sampling points for a site of approximately 0.42 ha with no known point sources for site characterisation purposes. Until the reporting date of this DSI, a total of 10 test locations were positioned across accessible areas of the site. It is understood that the data gap areas are currently occupied by:

- The basement level of Adina Hotel is on sandstone with no / minor fill (subbase layer); and
- Footprint of Lee Street pedestrian tunnel and footprint of the containment cell due to it was occupied by tenanted retail spaces and the drilling in Henry Deane Plaza encountered several underground services (in approximately 50% of the boreholes).

Two boreholes were located in the Adina Hotel basement near to the lifts (BH1001 and BH1002). Seven boreholes in the open-air portion of the Henry Deane Plaza between a retail tenancy on the southern side of the Plaza ('Priceline') and the northern side of a ramp leading down into the Lee Street pedestrian tunnel (i.e., Boreholes BH1003-BH1007, BH1003A and BH1004A). Three boreholes within a retail tenancy on the southern side of the Adina Hotel footprint, which is adjacent to the Lee Street pedestrian tunnel and beneath the ramp leading down eastwards into the Plaza from Lee Street (i.e., BH2001, BH2001A and BH2002).

It is noted that refusal on buried obstructions within rubble fill was encountered in Boreholes BH1003, BH1004, BH1006 and BH2001, with Borehole BH1006 abandoned in favour of a new location due to underground services (i.e., BH1007), whilst the other three boreholes were offset a short distance to new locations (i.e., BH1003A, BH1004A, BH20021A). It is noted that no soils samples were taken from BH2001.

Three boreholes from previous investigations found within the Site boundary were assessed in this DSI (i.e., Boreholes BH202 from the previous DP investigation and HA02 and HA03 from JBS&G 2019). BH202 located in the middle of the eastern boundary, however, was used for the groundwater assessment only (i.e., no soil samples were obtained).

Four nearby boreholes (i.e., Boreholes BH107A, BH107B, BH8 and BH110) along the eastern and north-eastern boundary of the Site from previous DP investigations were also included in this DSI to compare findings with the current soil results. It should be noted that BH107A was used for groundwater assessment only (i.e., no soil samples were obtained).

Soil samples selected for analysis included at least one fill sample from each borehole. Additional fill samples were selected from boreholes which encountered large amounts of anthropogenic material and / or where several layers of fill were observed.

The general soil sampling methods are described in the field work methodology, included in Appendix D

8.4 Drilling and Soil Sampling Procedure

Following coring of stone paving tiles (Henry Deane Plaza only) and concrete slabs using a diatube, each of the boreholes was commenced within soils using either non-destructive digging (NDD) vacuum excavation methods (Henry Deane Plaza only), or hand tools (e.g., hand auger). The boreholes were extended through the soils to the top of the underlying rock by either a track-mounted or tripod-mounted portable drilling rig, using auger and rotary drilling techniques.

Environmental sampling was performed with reference to standard operating procedures outlined in the DP field work methodology. All sampling data was recorded on borehole logs (Appendix E) and samples selected for laboratory analysis were recorded on DP chain-of-custody (COC) sheets (Appendix I). The general soil sampling procedure comprised:

- Decontamination of re-useable sampling equipment using a 2% concentrated critical-cleaning liquid detergent (D90) and demineralised water prior to collecting each sample;
- Collection of soil samples directly from auger / push tube returns;
- Use of disposable sampling equipment including disposable nitrile gloves;
- Transfer of samples into laboratory-prepared glass jars and capping immediately with Teflon lined lids;
- Labelling of sampling containers with individual and unique identification, including project number, sample location and sample depth;
- Field screening of replicate soil samples collected in sealed plastic bags for VOC using a calibrated PID; and
- Placement of sample containers and bags into a cooled, insulated and sealed container for transport to the laboratory under chain-of-custody (COC) documentation.

Soil samples were collected from 10 boreholes, including replicates of 3 primary samples.

Selected samples of fill and natural soils were analysed for the chemicals of concern identified in the CSM (section 7). Samples were selected based on site observations (odour, composition, etc.) and field results.

Envirolab Services Pty Ltd, accredited by NATA, was employed to conduct the primary sample analysis. ALS, accredited by NATA, was employed to conduct the inter-laboratory analysis.

8.5 Groundwater Well Installation and Sampling

In order to assess the current groundwater contamination status at the Site and evaluate whether historical / current / off-site land uses have impacted on groundwater, three groundwater monitoring wells installed for the geotechnical investigation (BH1002, BH1003A and BH1007) along with three monitoring wells installed for previous DP investigations (BH202, BH107A, BH107B) were used for groundwater sampling.

Groundwater monitoring wells were installed to depths of between 3.76 m and 18 m bgl. The rationale behind the well placement and well depth was to evaluate the quality of groundwater from both the Mittagong and Hawksbury formations and to gain an understanding of the groundwater contamination status across the Site (i.e., at up-gradient and down-gradient parts of the Site).

Monitoring well locations are shown on Drawing 1, Appendix B. Well installation details are included on the borehole logs, Appendix E.

Groundwater sampling was performed with reference to standard operating procedures outlined in the DP field work methodology. All sampling data was recorded groundwater field sheets (Appendix H) and samples selected for laboratory analysis were recorded on DP COC sheets (Appendix I). The general groundwater sampling procedure comprised:

- Decontamination of re-useable sampling equipment using a 1% concentrated critical-cleaning liquid detergent (Liquinox) and demineralised water prior to use;
- Use of disposable sampling equipment including disposable tubing and filters;
- Measurement of the groundwater level using an interface meter;
- Development of groundwater wells by removing a minimum of three bore volumes or until all standing water was removed from the well. Purged water was collected in drums for disposal to a licenced waste water facility;
- Allowing the wells to stabilise for at least five days prior to sampling;
- Micro-purging of wells using a low-flow sampling pump until physical parameter (temperature, dissolved oxygen, electrical conductivity, turbidity, pH and oxidation / reduction potential) had stabilised;
- Collection of groundwater samples directly into appropriate sampling bottles, some of which contained preservatives, using the low-flow sampling pump;
- Filtration of the dissolved metals sample through a disposable 0.45 um filter;
- Labelling of sampling bottles with individual and unique identification, including project number and sample location; and
- Placement of sample bottles into a cooled, insulated and sealed container for transport to the laboratory under COC documentation.

Groundwater samples from each well were analysed for the chemicals of concern listed in the CSM (Section 7) including a replicate sample. Envirolab Services Pty Ltd, accredited by NATA, was employed to conduct the primary sample analysis.

The general groundwater sampling methods are described in the field work methodology, included in Appendix D.

9. Site Assessment Criteria

The Site Assessment Criteria (SAC) applied in the current investigation are informed by the CSM (Section 7) which identified human and environmental receptors to potential contamination on the site. Analytical results are assessed (as a Tier 1 assessment) against the SAC comprising primarily the investigation and screening levels of Schedule B1 of NEPC (2013).

The investigation and screening levels applied in the current investigation comprise levels adopted for a generic commercial land use scenario. The derivation of the SAC is included in Appendix F and the adopted SAC are listed on the summary analytical results tables in Appendix C.

10. Field Work Results

10.1 Soil

The borehole logs for this assessment are included in Appendix E. The logs recorded the following general sub-surface profile:

STONE TILE (Henry Deane Plaza only):	Stone tiles (20-40 mm thick) laid over a layer of sand and cement 0.05-0.08 m thick; over
CONCRETE:	Single concrete slab (steel reinforcement not observed in Boreholes BH1001, BH1002, BH2001, BH2001A and BH2002), thickness ranging between 0.08-0.24 m; over
FILL:	Gravel or gravel and bricks (110 mm thick: Boreholes BH1001 and BH1002 only), or layers of clayey sand, sand, silt, or sandy clay, with either silty clay and gravel, cobble or boulder-sized fragments of sandstone, siltstone, igneous rock (railway ballast), concrete and brick rubble, or other anthropogenic materials (e.g., plastic bottles), trace ash and slag. The boreholes within the Henry Deane Plaza included one or more layers of building rubble in a clayey sand matrix, to depths ranging between 1.2 m and 3.5 m (refusal to Boreholes BH1003, BH1004 and BH1006 within these materials); over
ALLUVIAL SAND:	Medium dense to very dense alluvial sand (absent in Boreholes BH1001, BH1002 and BH2001A), typically wet, 1.0-3.7 m thick, including a thin layer (0.8 m thick) of stiff to very stiff silty clay in BH1007; over
ALLUVIAL SILTY CLAY:	Very soft to very stiff alluvial silty clay (Boreholes BH1004A and BH1005 only), 1.0-1.6 m thick, with traces of either charcoal and fine gravel; over
RESIDUAL CLAY:	Firm to very stiff residual silty clay or sandy clay (absent in Borehole BH1004A), 0.18-1.8 m thick, with traces of fine sand and / or gravel; over
RESIDUAL CLAYEY SAND or SANDY CLAY:	Medium dense to very dense residual clayey sand with occasional thin clay bands or very stiff to hard sandy clay (present in Boreholes BH1003, BH1005, BH1007 and BH2002 only), with relict rock texture (extremely weathered sandstone); over
SANDSTONE (MEDIUM GRAINED):	Very low to medium strength, medium grained sandstone, with both clay seams and iron-cemented bands of up to medium to high strength (absent in Boreholes BH1005 and BH1007); over
SANDSTONE (MEDIUM TO COARSE GRAINED):	Medium or high strength, medium to coarse grained sandstone, typically with widely spaced extremely low or very low strength bands.

The medium grained sandstone is interpreted to be part of the Mittagong Formation, and the underlying medium to coarse grained sandstone is interpreted to be Hawkesbury Sandstone.

During drilling, no other visual or olfactory evidence of anthropogenic substances (e.g., staining or odours) was observed other than those materials listed above.

The PID screening recorded readings of less than 1 ppm for all samples with the exception of samples BH1007/2.5-2.95 and BH1007/4-4.45 which recorded values of 60 ppm and 16 ppm, respectively.

10.2 Groundwater

With the exception of Borehole BH1007, groundwater was not observed during auger drilling and prior to the commencement of rotary drilling or rock coring. Monitoring wells were installed in three boreholes BH1002, BH1003A and BH1007, comprising screened PVC pipe with gravel backfill, a bentonite pellet seal, and 'gatic' cover at ground level (refer to Borehole 'Well' Logs in Appendix E for specific details). It is noted that the screened intervals were selected to target either the medium or high strength sandstone (i.e., BH1002, BH1007), or the alluvial sand (i.e., BH1003A).

Groundwater level observations for the installed monitoring wells and previous DP monitoring wells used for sampling are summarised in Table 3 and Table 4.

Table 3: Groundwater Observations in New Monitoring Wells

Measurement Date	Standing Water Level Measurements in Boreholes					
	BH1002		BH1003A		BH1007	
	Depth (m)	RL (1)	Depth (m)	RL (1)	Depth (m)	RL 1)
19/03/2021	16.4	-3.0	2.8	11.5	9.2	6.6
22/03/2021	16.3	-2.9	2.8	11.5	9.3	6.5

Notes: (1) Elevation (RL) in metres AHD.

Table 4: Groundwater Observations in Previous DP Monitoring Wells

Measurement Date	Standing Water Level Measurements in Boreholes					
	BH107A		BH107B		BH202	
	Depth (m)	RL (1)	Depth (m)	RL (1)	Depth (m)	RL 1)
19/03/2021	1.9	13.6	2.2	13.3	3.3	13.0
22/03/2021	1.6	13.9	1.9	13.6	3.0	13.3

Notes: (1) Elevation (RL) in metres AHD.

Based on the groundwater level measurements, groundwater is interpreted to be flowing in a north, north-westerly direction towards Blackwattle Bay and Darling Harbour which is located approximately 1.1 km north-west of the site. This was expected given the topography and the location of the down-gradient discharge point (i.e., Blackwattle Bay and Darling Harbour).

The stabilised groundwater field parameters recorded prior to sampling are shown on the groundwater field sheets included in Appendix E and are summarised in Table 5.

Table 5: Summary of Field Parameters (Groundwater and Surface Water)

Well / Sample ID	Temp. (°C)	DO (ppm)	Turbidity	EC (µS/cm)	pH	Redox (mV)
BH1002	21.2	3.10	532	348.9	5.79	103
BH1003A	22.1	4.36	712	241	6.35	74
BH1007	20.7	3.23	941	461	6.15	78.2
BH107A	21.7	3.44	260	416	6.26	64
BH107B	21.5	3.58	594	384.1	6.26	33.6
BH202	21.0	3.50	489	178	5.66	50

Groundwater was observed to be clear-yellow (BH107A), clear-grey (BH107B) and clear-brown (BH202, BH1002, BH1003A and 1007). No light non-aqueous phase liquid LNAPL was observed whilst sampling.

11. Laboratory Results

The results of laboratory analysis are summarised in the following tables in Appendix C:

- Table C1: Summary of Results of Soil Analysis;
- Table C2: Summary of Soil VOC Analysis; and
- Table C3: Summary of Results of Water Analysis;
- Table C4: Summary of groundwater VOC Analysis; and
- Table C5: Summary of Waste Classification Assessment.

The laboratory certificate(s) of analysis together with the chain of custody and sample receipt information are provided in Appendix I.

11.1 Soil

A total of twenty-four (24) main soil samples and three replicate samples were submitted to a NATA-accredited laboratory for the analysis of heavy metals, PAH, TRH, BTEX, phenols, OCP, OPP, PCB, VOC and asbestos. Two soil samples from JBS&G 2019 (HA02 and HA03) were analysed for heavy metals, PAH, TRH, BTEX, OCP, PCB and asbestos.

Concentrations of BTEX, phenol, OCP and OPP were below the PQL and, hence, within the adopted SAC for commercial land use. Concentration of heavy metals, PAH, TRH and PCB were above the PQL but all within the adopted SAC.

The PQL was used for the initial screening of VOC. The results indicate that the VOC concentrations were below the PQL in the analysed sample from BH1003/0.25-0.3, BH1003A/0.8-0.9, BH1004/0.6-0.7 and BH1007/0.2-0.3.

Friable chrysotile asbestos was detected in sample BH1007/2.0-2.1 at a concentration of 0.0016% w/w, which is marginally above the adopted HSL-D criteria of 0.001% w/w. Except for BH1007/2.0-2.1, asbestos was not detected above the limit of reporting in the analysed samples and potential ACM was not observed in samples. It is noted that building rubble (such as brick and concrete) was observed in the fill and ACM can be associated with the building rubble in fill.

Current investigation results are consistent with the previous investigation results from nearby boreholes (i.e., 107B, BH8 and BH110).

11.2 Groundwater

Six groundwater samples were analysed for: heavy metals (dissolved and total), PAH, TRH, BTEX, OCP, OPP, PCB, VOC, hardness, dissolved ions and cyanide.

From all groundwater samples tested, all reported concentrations of contaminants including VOC were below the PQL, and hence below the adopted SAC with the exceptions of both dissolved and total heavy metals, as follows:

Total heavy metals:

- Cadmium in BH107A (0.8 µg/L), and BH 1007 (3.9 µg/L) which exceeded the hardness modified GILs of 0.2-0.6 µg/L;
- Chromium (III+VI) in BH107A (13 µg/L), BH107B (41 µg/L), BH1002 (20 µg/L), BH1003A (21 µg/L), and BH1007 (57 µg/L) which exceeded the hardness modified GILs of 3.9-9.6 µg/L as Cr(III) and 1.0 µg/L as Cr(VI);
- Copper in BH107A (13 µg/L), BH107B (38 µg/L), BH1002 (37 µg/L), BH1003A (31 µg/L), and BH1007 (110 µg/L) which exceeded the GIL of 1.4 µg/L;
- Lead in BH107B (38 µg/L), BH1002 (45 µg/L), and BH1007 (81 µg/L) which exceeded the hardness modified GILs of 4.4-17.7 µg/L;
- Nickel in BH107B (100 µg/L), and BH1007 (38 µg/L) which exceeded the hardness modified GILs of 13.1-32.2 µg/L; and
- Zinc in BH107A (95 µg/L), BH107B (190 µg/L), BH202 (42 µg/L), BH1002 (570 µg/L), BH1003A (370 µg/L), and BH 1007 (4300 µg/L) which exceeded the hardness modified GILs of 9.6-24.1 µg/L.

Dissolved heavy metals:

- Copper in BH1002 (2 µg/L), BH1003A (18 µg/L), and BD1/230321 (2 µg/L) (the replicate of BH1007) which exceeded the GIL of 1.4 µg/L; and
- Zinc in BH107A (25 µg/L), BH1002 (140 µg/L), BH1003A (86 µg/L), BH 1007 (110 µg/L), and it's replicate BD1/230321 (140 µg/L) which exceeded the hardness modified GILs of 9.6-24.1 µg/L.

It is noted that the concentration exceedances of heavy metals are mainly detected in the form of total metals rather than dissolved metals. For dissolved metals, the elevated concentrations were only detected for copper and zinc. The elevated concentrations of copper in BH1002, BH1003A, BH1007 and zinc in BH107A, BH1002, BH1003A, and BH1007 are considered to be within the normal range of background levels in heavily urbanised areas of Sydney and especially adjacent to Central Station railway.

Based on the Site topography, BH1002, BH1007, and BH107A can be considered 'up-gradient' wells which are most likely to be indicative of the groundwater condition in the greater surrounding area.

11.3 Preliminary Waste Classification

The following Table 6 presents the results of the six-step procedure outlined in NSW EPA (2014) for determining the type of waste and the waste classification. This process applies to the fill (including surface soils) at the site, which do not meet the definition of VENM.

Table 6: Six Step Classification Procedure

Step	Comments	Rationale
1. Is the waste special waste?	Yes - Henry Dean Plaza area	No asbestos-containing materials (ACM), clinical or related waste, or waste tyres were observed in the boreholes. Chrysotile asbestos was detected by the analytical laboratory in sample (BH1007/2.0-2.1).
	No - Adina Hotel Basement Footprint	No asbestos-containing materials (ACM), clinical or related waste, or waste tyres were observed in the boreholes. Asbestos was not detected by the analytical laboratory.
2. Is the waste liquid waste?	No	The fill comprised a soil matrix.
3. Is the waste "pre-classified"?	No	The fill is not pre-classified with reference to NSW EPA (2014). The natural material, if classified as VENM, is pre-classified as General Solid Waste (non-putrescible).
4. Does the waste possess hazardous waste characteristics?	No	The fill was not observed to contain or considered at risk to contain explosives, gases, flammable solids, oxidising agents, organic peroxides, toxic substances, corrosive substances, coal tar, batteries, lead paint or dangerous goods containers.

Step	Comments	Rationale
5. Determining a wastes classification using chemical assessment	Conducted	Refer to Table C4 (attached).
6. Is the waste putrescible or non-putrescible?	Non-putrescible	The fill does not contain materials considered to be putrescible [a].

Note: a wastes that are generally not classified as putrescible include soils, timber, garden trimmings, agricultural, forest and crop materials, and natural fibrous organic and vegetative materials (NSW EPA, 2014).

The field and laboratory data quality assurance and quality control results for the samples have been reviewed and are considered to be acceptable. The laboratory certificates are attached. Reference should be made to DP (2021a) for further information on the data quality assurance and quality control assessment.

Concentrations of contaminants for the analysed soil samples in the Henry Dean Plaza area were within the contaminant thresholds (CT1) for General Solid Waste (GSW) with the exception of:

- Lead in BH1005/1.55-1.65, with a concentration of 210 mg/kg, exceeding the CT1 of 100 mg/kg;
- Nickel in BH2001A/0.15-0.2, with a concentration of 49 mg/kg, exceeding the CT1 of 40 mg/kg;
- Benzo(a)pyrene (B(a)P) in BH1003/0.25-0.3, BH1004/0.3-0.4, BH1004/ 0.6-0.7, BH1005/0.22-0.3, BH1005/0.5-0.6, BH1005/1.55-1.65 and BH1007/2.0-2.1. Exceedances ranged from 0.94 mg/kg to 8.4 mg/kg, exceeding the CT1 of 0.8 mg/kg; and
- Asbestos, which was detected in BH1007/2.0-2.1.

Toxicity characteristic leaching procedure (TCLP) analysis was undertaken on five samples with the highest B(a)P, nickel and lead contaminant concentrations to determine the leachability characteristics of the contamination. All concentrations were within specific contaminant concentration (SCC1) and TCLP1 for GSW.

Furthermore, samples with the highest concentrations of PAH, including B(a)P, and lead were observed to contain ash and slag, possibly the source of the contamination.

The NSW EPA Immobilisation of Contaminants in Waste 1999/05 is a general immobilisation approval for ash / coal-contaminated materials, whilst the NSW EPA Immobilisation of Contaminants in Waste 2009/07 is a general immobilisation for metallurgical furnace slag. These immobilisations allow waste classification for such materials based on their leachability concentration (TCLP) value alone. Given the low leachability of B(a)P and PAH in the samples analysed, it is considered the appropriate immobilisation approvals could be applied in the final waste classification to materials containing concentrations of B(a)P which exceed the GSW criteria where ash, clinker and / or slag are observed.

Sample BH1007/2.0-2.1 recorded a concentration of 0.0016% w/w of chrysotile asbestos. Given the observation of significant quantities of building rubble in the boreholes BH1003-BH1007, the fill within the Henry Dean Plaza area has been given a preliminary waste classification of **GSW (non-putrescible) Special Waste (Asbestos).**

The materials in the Adina Hotel basement footprint recorded lower concentrations of the contaminants in the fill soils than the Henry Deane Plaza footprint, with all analysed soil samples within the contaminant thresholds (CT1) for GSW. Therefore, the fill within the Adina Hotel basement footprint has been given a preliminary waste classification of **GSW (non-putrescible)**. It should be noted that brick was observed in BH1002 which (along with other building demolition materials) can be an indicator for the potential presence of asbestos, hence this should be considered for future waste classification investigations of the fill in this area.

Table 7: Waste Classification Summary - Fill

Item	Description
Based on the observations at the time of sampling and the reported analytical results, the fill described as:	Layers of clayey sand, sand, silt, or sandy clay with gravel and cobble size fragments of sandstone, igneous rock (railway ballast), concrete, brick, building rubble, ash, slag and other anthropogenic materials (e.g., plastic bottles), with one or more layers of building rubble in a clayey sand matrix, to depths ranging between 1.2 m and 3.5 m in the Henry Dean Plaza area. Gravel and brick fill to a depth of 0.35 m in Adina Hotel footprint.
Within the Adina Hotel basement footprint area:	General Solid Waste (Non-Putrescible)
Within the Henry Dean Plaza area:	Special Waste (Asbestos) - General Solid Waste (non-putrescible)
The form of asbestos identified within the material was:	Chrysotile - Asbestos Fines / Friable Asbestos.

It is noted that concentrations of contaminants for the analysed soil samples in the nearby boreholes (i.e., BH107B, BH110 and BH8) area were within the contaminant thresholds (CT1) for General Solid Waste (GSW) with the exception of Benzo(a)pyrene (B(a)P) exceed CT1 but within specific contaminant concentration (SCC1) and TCLP1 for GSW, which is consistent with the soils classification within Adina Hotel area.

11.3.1 Classification of Natural Soils

The following Tables 8 and 9 present the results of the assessment of natural soils and bedrock at the site with reference to the VENM definition in the POEO Act and the EPA[8] website.

[8] https://www.epa.nsw.gov.au/your-environment/waste/classifying-waste/virgin-excavated-natural-material

Table 8: VENM Classification Procedure

Item	Comments	Rationale
Is the material natural?	Yes	Natural materials logged in the boreholes as alluvial sand, alluvial silty clay, residual clay, residual clayey sand. These materials underlie the fill at the site.
Is the material impacted by manufactured chemicals or process residues?	Possibly	There were no visual or olfactory indicators of chemical contamination of the materials in the test pits. Concentrations of contaminants were considered to be typical of background concentrations (Table A1) with the exception of TRH (C10-C36) in BH1004A/3.1-3.55. B(a)P was detected in BH1005/2.8-2.95.
Are the materials acid sulfate soils?	No	Refer to section 4.
Are there current or previous land uses that have (or may have) contaminated the materials?	Possibly	Previous land use is likely the cause of B(a)P and TRH detections in the natural material, although leachability testing indicates that the leaching potential of the contaminants is low.

Concentration of the analysed natural soil samples were within the published concentrations in NSW EPA *The Excavated Natural Material Order 2014* except TRH (C10-C36) in BH1004A/3.1-3.55. However, some contaminants, including B(a)P, were detected above the laboratory practical quantitation limit (PQL) were detected in some shallow natural samples. It should be noted that shallow natural soils such as alluvium can contain PAH from historical bush fire residues or because it is directly beneath the fill which may be impacted by the overlying materials. It is therefore recommended that for project planning, the top 0.5 m of the natural soil profile is assumed to be General Solid Waste (non-putrescible), particularly in the Henry Dean Plaza area.

Table 9: Waste Classification Summary - Natural Soils

Item	Description
Based on the outcomes presented in Table 8, the natural soils and bedrock described as:	Alluvial sand, alluvial silty clay, residual clay, residual clayey sand and sandstone.
Within the area subject to classification as shown on Drawing 1, is classified as:	VENM (assume from below the upper 0.5 m of the natural soil profile).

It is noted that the information provided in this section does not constitute a final waste classification for off-site disposal purposes. Should excavated soils require off-site disposal during development further testing and a final waste classification assessment, which takes into consideration the information in this report, must be undertaken.

12. Recommendations and Conclusion

Based on the Site history, the potential sources of contamination include: uncontrolled fill, a historical containment cell, current and historical site uses, previous and current off-site activities in the surrounding area, and hazardous building materials in existing structures. The COPC from these sources include metals, TRH, BTEX, PAH, PCB, OCP, OPP, phenols, VOC, asbestos and cyanide.

Laboratory testing results from the current investigation confirms the presence of some of the COPC in the soil and groundwater. Friable chrysotile asbestos was detected in sample BH1007/2.0-2.1 at a concentration of 0.0016% w/w, which is above the adopted HSL-D criteria of 0.001% w/w. In groundwater, dissolved copper and zinc were detected at concentrations above the groundwater SAC.

The elevated levels of copper and zinc in groundwater are common in heavily urbanised areas and especially adjacent to Central Station. The source of copper and zinc is uncertain but could be linked to the copper and zinc concentrations in the fill layer on site, or to the services network at the Site or in proximity to the Site, as elevated levels of copper and zinc were identified in both the upgradient and downgradient groundwater wells. Considering that elevated levels of copper and zinc were not evident in the fill, the copper and zinc levels identified in the groundwater wells at the Site are likely to represent regional background levels rather than site-specific levels.

Given dewatering is required at the Site, further groundwater sampling is likely to be requested by the City of Sydney Council to assess for the quality and suitability of groundwater prior to stormwater discharge. Alternatively, groundwater can be discharged into sewer subject to approval from Sydney Water or disposal of groundwater to a licensed liquid waste facility. Further information on dewatering requirements can be found in DP, Report on Groundwater Modelling, Proposed Commercial Development 2-8a Lee Street, Haymarket, 21 June 2022 (86884.02.R.006.Rev01).

Results from the investigation indicates that fill is present across the Site at depths of between 0.35 m and 3.5 m bgl. The fill was deepest in BH1007 and BH1004. Excluding the boreholes located in Adina Hotel basement (BH1001 and BH1002), the shallowest fill was in BH1003A and BH1003. It is noted that the deeper fill was generally correlated with a higher surface level. This is likely due to fill being used across the Site historically for levelling purposes. The fill was underlain by alluvial sand, residual clay and Hawkesbury sandstone. Anthropogenic materials (typically traces of) were encountered sporadically in the fill at the majority of test locations. The anthropogenic material included brick fragments, plastic, ash and slag.

The fill within the Adina Hotel basement footprint area is preliminarily classified as General Soil Waste (non putrescible) with reference to NSW EPA (2014), whilst the fill within the Henry Dean Plaza area is preliminary classified as Special Waste (Asbestos) - General Solid Waste (non-putrescible). The natural soils below the upper 0.5 m of the natural soil profile is preliminarily classified as VENM.

Based on the results of this DSI, it is considered that the Site can be made suitable for the proposed commercial development as outlined in Section 1 subject to the following recommendations:

- Implementation of actions outlined in the Remediation Action Plan (RAP) (86884.05.R.003.Rev0) to render the Site suitable for the proposed development. Significant contamination identified during the remediation (including unexpected finds) may warrant an amendment or addendum to the RAP such that appropriate actions are managed and documented;

- Intrusive investigations (sampling and testing) within the footprints of the Adina Hotel, the Lee Street pedestrian tunnel and the containment cell in Henry Deane Plaza (currently occupied by tenanted retail spaces, this investigation can only occur post-approval once the building has been demolished) (See Drawing D.002 for proposed test locations). Further information on additional sampling recommendations, including sampling locations and rationale, is to be provided in the Remediation Action Plan (86884.05.R.003.Rev0);
- Following demolition works, additional investigation (site walkover, sampling and testing) of the footprints of any demolition works to prevent cross-contaminating the subsurface soils with hazardous building material such as asbestos;
- Following demolition works, additional soil sampling and testing, either using *in situ* or *ex situ* sampling methods, to provide a final waste classification for surplus soils requiring off-site disposal during the excavation stage of the project; and
- Further investigation of groundwater particularly to assess the presence of both dissolved and total metals across the Site prior to and during dewatering. It is also noted that a groundwater management plan is likely to be required as part of the application for a dewatering license.

13. References

CRC CARE. (2011). *Health screening levels for petroleum hydrocarbons in soil and groundwater.* Parts 1 to 3, Technical Report No. 10: Cooperative Research Centre for Contamination Assessment and Remediation of the Environment.

CRC CARE. (2017). *Risk-based Management and Remediation Guidance for Benzo(a)pyrene.* Technical Report no. 39: Cooperative Research Centre for Contamination Assessment and Remediation of the Environment.

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM].* Australian Government Publishing Services Canberra: National Environment Protection Council.

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

NSW EPA. (2014). *Waste Classification Guidelines, Part 1: Classifying Waste.* NSW Environment Protection Authority.

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

14. Limitations

Douglas Partners (DP) has prepared this report for this project at 2-8a Lee Street, Haymarket in accordance with DP's proposal dated 27 January 2021 and acceptance received from Toga Development and constructions Pty Ltd. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Toga Development and Construction Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

The assessment of atypical safety hazards arising from this advice is restricted to the environmental components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

Asbestos has been detected by laboratory analysis in fill materials at the test locations sampled and analysed. Building demolition materials, such as brick rubble observed in the fill profile during the current field investigation, and these are considered as indicative of the possible presence of hazardous building materials (HBM), including asbestos.

Although the sampling plan adopted for this investigation is considered appropriate to achieve the stated project objectives, there are necessarily parts of the site that have not been sampled and analysed. This is either due to undetected variations in ground conditions, or to parts of the site being inaccessible and not available for sampling. It is therefore considered possible that HBM, including asbestos, may be present in unobserved or untested parts of the site, between and beyond sampling locations, and hence no warranty can be given that asbestos is not present.

The contents of this report do not constitute formal design components such as are required, by the Health and Safety Legislation and Regulations, to be included in a Safety Report specifying the hazards likely to be encountered during construction and the controls required to mitigate risk. This design process requires risk assessment to be undertaken, with such assessment being dependent upon factors relating to likelihood of occurrence and consequences of damage to property and to life. This, in turn, requires project data and analysis presently beyond the knowledge and project role respectively of DP.

Douglas Partners Pty Ltd

Appendix A

About this Report

About this Report

Douglas Partners

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

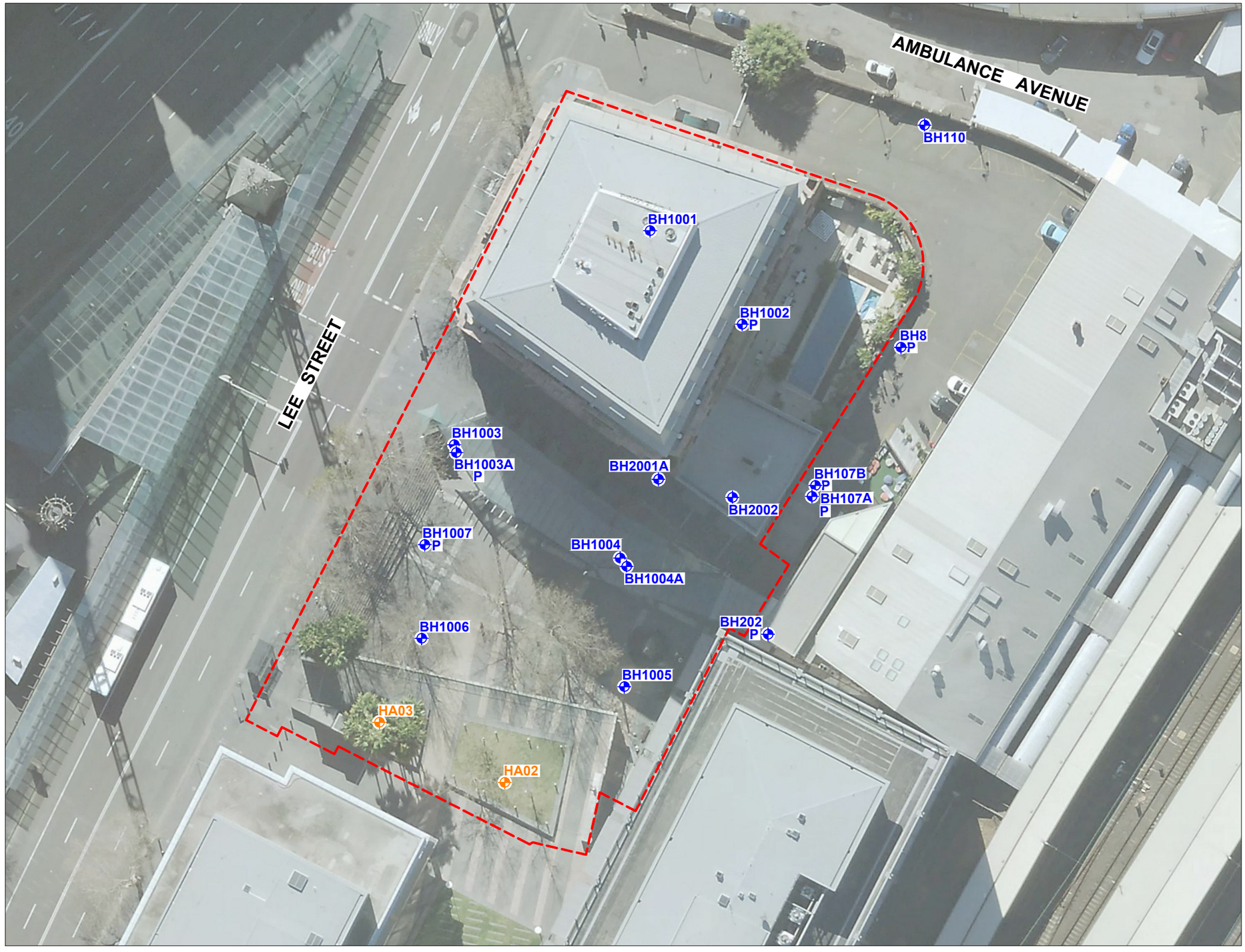
Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

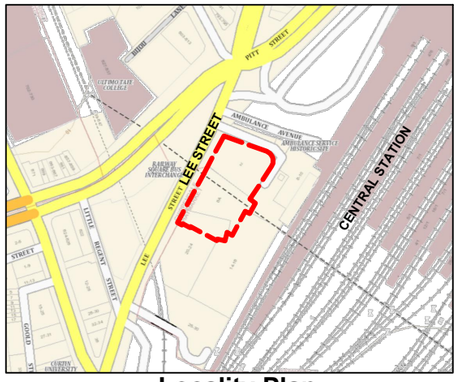
Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

Appendix B

Site Drawings





Locality Plan

NOTE:
1: Base image from MetroMap, dated 30 July 2021
2: Co-ordinate system relative to Map Grid of Australia 1994 (MGA94).

0 5 10 15 20 30 40 50m
1:500 @ A3

LEGEND

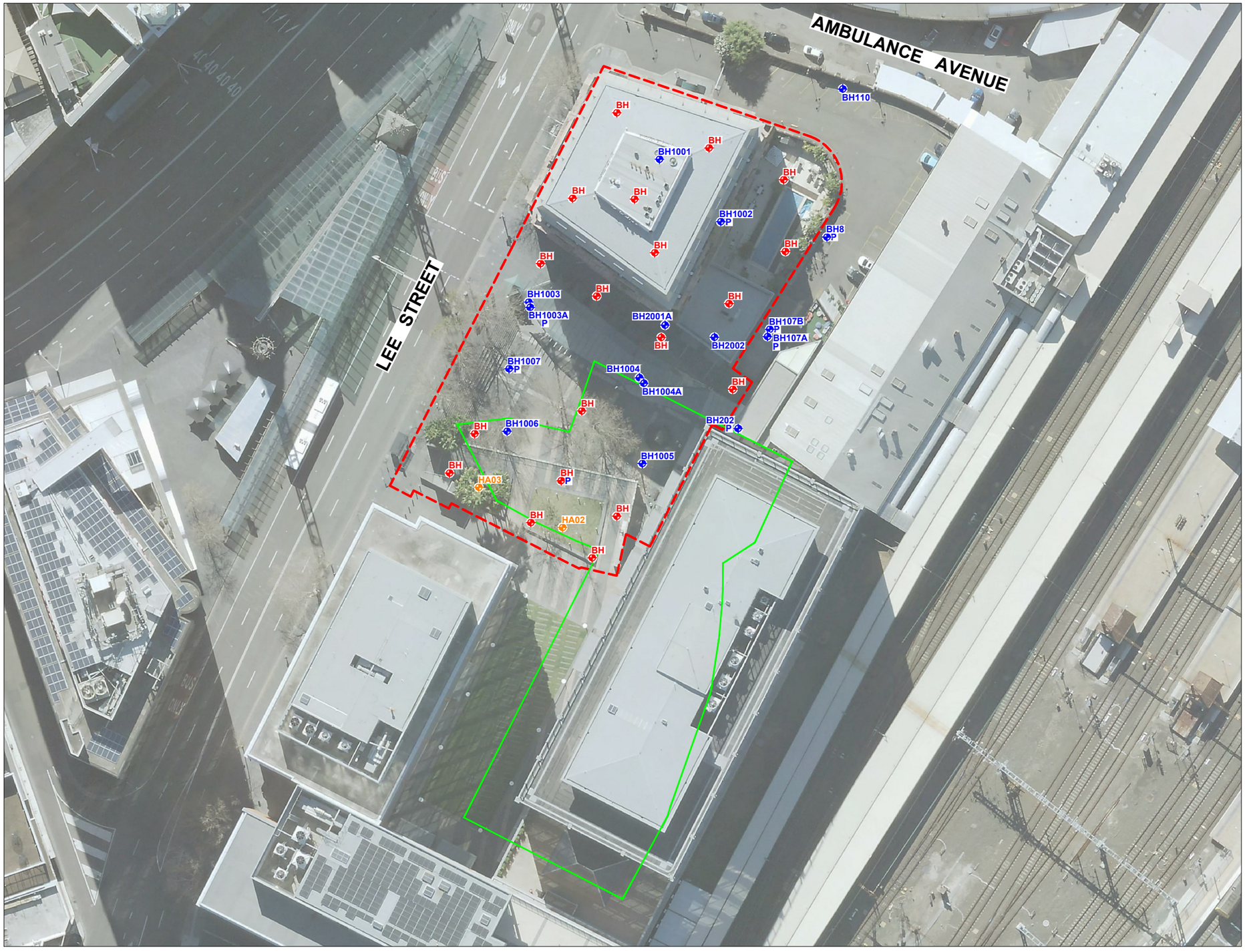
- HA — Approximate Previous Borehole Locations (JBS&G 2019)
- BH — Previous DP Borehole Locations (DP 2021 a-c)
- P — Standpipe Piezometer
- Site Boundary

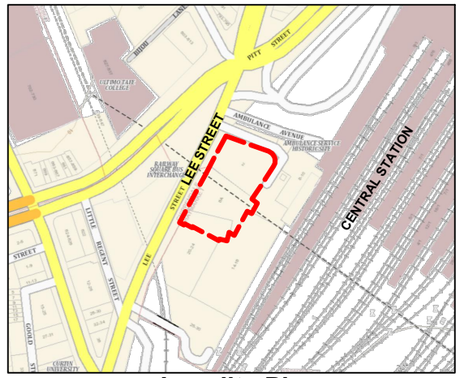
Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: Toga Development and Construction Pty Ltd		TITLE: **Site and Test Location Plan** **Proposed Commercial Development** **2-8A Lee Street, Haymarket**
OFFICE: Sydney	DRAWN BY: MG	
SCALE: 1:500 @ A3	DATE: 01.07.2022	

N

PROJECT No:	86884.05
DRAWING No:	1
REVISION:	0





Locality Plan

NOTE:
1: Base image from MetroMap, dated 30 July 2021
2: Co-ordinate system relative to Map Grid of Australia 1994 (MGA94).

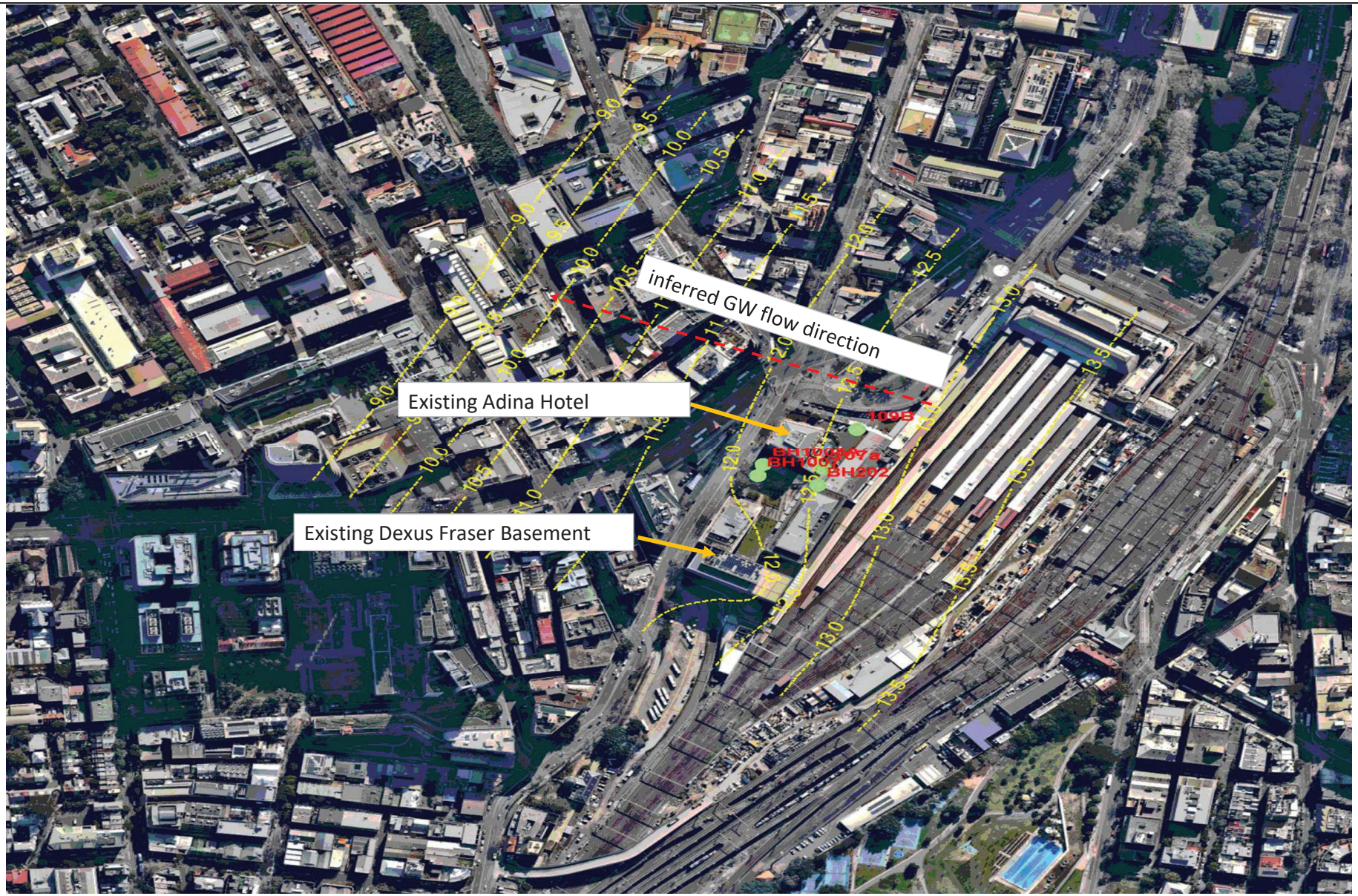
0 5 10 15 20 30 40 50 75m
1:750 @ A3

LEGEND

- HA — Approximate Previous Borehole Locations (JBS&G 2019)
- BH — Previous DP Borehole Locations (DP 2021 a-c)
- BH — Proposed Borehole Locations
- P — Standpipe Piezometer
- Approximate Outline of The Containment Cell
- Site Boundary

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: Toga Development and Construction Pty Ltd		TITLE: **Proposed Test Location and Existing Containment Cell Plan**	PROJECT No: 86884.05
OFFICE: Sydney	DRAWN BY: MG	**Proposed Commercial Development**	DRAWING No: 2
SCALE: 1:750 @ A3	DATE: 01.07.2022	**2-8A Lee Street, Haymarket**	REVISION: 0



Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: Toga Development and Construction Pty Ltd		TITLE: **Existing Groundwater Table**	PROJECT No:	86884.02
	OFFICE: Sydney	DRAWN BY: DB	**Proposed Commercial Development**	DRAWING No:	M1
	SCALE: NTS	DATE: 18 Nov 2021	**2-8A Lee Street, Haymarket**	REVISION:	A

Appendix C

Results Tables

Douglas Partners
Geotechnics | Environment | Groundwater

Table C1: Summary of Laboratory Results – Metals, TRH, BTEX, PAH, Phenol, OCP, OPP, PCB, Asbestos, Asbestos

			Metals								TRH						BTEX				PAH				Phenol	OCP										OPP	PCB	Asbestos						
			Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	TRH C6 - C10	TRH >C10-C16	TPH (C6-C10/BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene [b]	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ	Total PAHs	Phenol	DDD	DDT+ DDE+DDD [c]	DDE	DDT	Aldrin& Dieldrin	Total Chlordane	Endrin	Total Endosulfan	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Methoxychlor	Chlorpyrifos	Total PCB	Asbestos ID in soil >0.1g/kg	Trace Analysis	Asbestos (S) g	Asbestos ID soil <0.1g/kg	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation	Asbestos (FCB 04)
		PQL	4	0.4	1	1	1	0.1	1	1	25	50	25	50	100	100	0.2	0.5	1	1	1	0.05	0.5	0.05	5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1							<0.001	0.001
DP2021																																															
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	-	-	-	g	g	%(w/w)	-
BH1001	0.25-0.3 m	12/03/2021	<4	<0.4	**4**	**13**	**11**	<0.1	**4**	**16**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.1**	<0.5	**0.73**	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**NAD**	**NAD**	**NAD**	-	-	-	-	-
			3000	900	3600	240000	1500	730	6000	400000			230	NL			3	NL	NL	230	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
BH1001	0.5-0.6 m	12/03/2021	**6**	<0.4	**7**	**4**	**7**	<0.1	<1	**5**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000	900	3600	240000	1500	730	6000	400000			230	NL			3	NL	NL	230	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
BH1002	0.25-0.35 m	11/03/2021	<4	<0.4	**6**	**20**	**13**	<0.1	**4**	**28**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.1**	<0.5	**0.65**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**NAD**	**NAD**	**NAD**	-	-	-	-	-
			3000	900	3600	240000	1500	730	6000	400000			230	NL			3	NL	NL	230	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
BH1002	0.35-0.5 m	11/03/2021	<4	<0.4	**6**	**3**	**4**	<0.1	<1	**6**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**NAD**	**NAD**	**NAD**	**NAD**	-	**NAD**	-	-
			3000	900	3600	240000	1500	730	6000	400000			230	NL			3	NL	NL	230	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
BH1003	0.25-0.3 m	10/03/2021	<4	<0.4	**6**	**17**	**40**	**0.2**	**4**	**37**	<25	<50	<25	<50	**170**	<100	<0.2	<0.5	<1	<1	**0.94**	**1.2**	**9.3**	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			3000	900	3600	240000	1500	730	6000	400000			230	NL			3	NL	NL	230	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
BH1003A	0.8-0.9 m	10/03/2021	<4	<0.4	**7**	**8**	**32**	**0.2**	**2**	**35**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.73**	**1**	**8.9**	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**NAD**	**NAD**	**NAD**	**NAD**	-	**NAD**	-	-
			3000	900	3600	240000	1500	730	6000	400000			230	NL			3	NL	NL	230	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
BH1003A	1.9-2 m	10/03/2021	<4	<0.4	<1	**1**	<0.1	<1	**4**	<25	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**NAD**	**NAD**	**NAD**	-	-	-	-	-
			3000	900	3600	240000	1500	730	6000	400000			230	NL			3	NL	NL	230	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
BH1004	0.3-0.4 m	11/03/2021	<4	<0.4	**8**	**37**	**72**	**0.5**	**6**	**82**	<25	<50	<25	<50	**170**	<100	<0.2	<0.5	<1	<1	**2.9**	**4.2**	**34**	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**NAD**	**NAD**	**NAD**	-	-	-	-	-
			3000	900	3600	240000	1500	730	6000	400000			230	NL			3	NL	NL	230	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
BH1004	0.6-0.7 m	11/03/2021	<4	<0.4	**6**	**12**	**75**	**0.3**	**3**	**38**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**1.2**	**1.8**	**15**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**NAD**	**NAD**	**NAD**	-	-	-	-	-
			3000	900	3600	240000	1500	730	6000	400000			230	NL			3	NL	NL	230	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
BH1004A	3.1 - 3.55 m	17/03/2021	<4	<0.4	**2**	**6**	**5**	<0.1	**2**	**48**	<25	**320**	<25	**320**	**250**	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000	900	3600	240000	1500	730	6000	400000		630	NL	NL			3	NL	NL	NL	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
BH1005	0.22-0.3 m	11/03/2021	<4	<0.4	**7**	**29**	**59**	**0.3**	**6**	**68**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**1.8**	**11**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**NAD**	**NAD**	**NAD**	-	-	-	-	-
			3000	900	3600	240000	1500	730	6000	400000			230	NL			3	NL	NL	230	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
BH1005	0.5-0.6 m	11/03/2021	**5**	<0.4	**8**	**27**	**66**	**0.3**	**4**	**74**	<25	<50	<25	<50	**200**	<100	<0.2	<0.5	<1	<1	<1	**2.7**	**3.9**	**33**	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**NAD**	**NAD**	**NAD**	-	-	-	-	-
			3000	900	3600	240000	1500	730	6000	400000			230	NL			3	NL	NL	230	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
BH1005	1.55-1.65 m	11/03/2021	<4	<0.4	**9**	**37**	**210**	**0.7**	**6**	**150**	<25	<50	<25	<50	**320**	<100	<0.2	<0.5	<1	<1	**9**	**8.4**	**12**	**160**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**NAD**	**NAD**	**NAD**	-	-	-	-	-
			3000	900	3600	240000	1500	730	6000	400000			230	NL			3	NL	NL	230	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
BH1005	2.8 - 2.95 m	15/03/2021	<4	<0.4	**3**	**4**	**15**	<0.1	**1**	**14**	<25	<50	<25	<50	**110**	<100	<0.2	<0.5	<1	<1	<1	**0.54**	**0.7**	**7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000	900	3600	240000	1500	730	6000	400000			230	NL			3	NL	NL	230	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
BH1007	0.2-0.3 m	11/03/2021	<4	<0.4	**9**	**24**	**53**	**0.3**	**7**	**50**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.3**	<0.5	**2.7**	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**NAD**	**NAD**	-	**NAD**	-	-	**NAD**	**NAD**
			3000	900	3600	240000	1500	730	6000	400000			230	NL			3	NL	NL	230	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
BH1007	2 - 2.1 m	16/03/2021	<4	<0.4	**11**	**23**	**51**	**0.2**	**3**	**49**	<25	<50	<25	<50	**120**	<100	<0.2	<0.5	<1	<1	<1	**1.5**	**2.1**	**17**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**NAD**	**NAD**	-	**Chrysotile**	-	**0.0169**	**0.0016**	**NAD**
			3000	900	3600	240000	1500	730	6000	400000			630	NL			3	NL	NL	NL	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
BH1007	2.5 - 2.95 m	16/03/2021	<4	<0.4	**4**	**2**	**8**	<0.1	**1**	**11**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	**3.5**	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**NAD**	**NAD**	**NAD**	-	-	-	-	-
			3000	900	3600	240000	1500	730	6000	400000			230	NL			3	NL	NL	230	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
BH1007	4 - 4.45 m	16/03/2021	<4	<0.4	**1**	<1	<1	<0.1	<1	**4**	<25	**76**	<25	**76**	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000	900	3600	240000	1500	730	6000	400000			230	NL			3	NL	NL	230	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
BH1007 - [TRIPLICATE]	2.5 - 2.95 m	16/03/2021	<4	<0.4	**8**	**8**	**27**	<0.1	**2**	**13**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000	900	3600	240000	1500	730	6000	400000			630	NL			3	NL	NL	NL	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
BH1007	2 - 2.1 m	16/03/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000	900	3600	240000	1500	730	6000	400000			630	NL			3	NL	NL	NL	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
BH2001A	0.15-0.2 m	21/06/21	<4	<0.4	**22**	**32**	**11**	<0.1	**49**	**33**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**NAD**	-	-	**NAD**	**NAD**
			3000	900	3600	240000	1500	730	6000	400000			240	NL			3	NL	NL	230	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
BH2001A	1.8-1.9 m	21/06/21	<4	<0.4	**4**	**4**	**12**	<0.1	**2**	**13**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.65**	**0.9**	**7.2**	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
			3000	900	3600	240000	1500	730	6000	400000			240	NL			3	NL	NL	230	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
BH2001A	1.0-1.1 m	21/06/21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**NAD**	-	-	**NAD**	**NAD**
			3000	900	3600	240000	1500	730	6000	400000			240	NL			3	NL	NL	230	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
BH2001A/1.8-1.9 - [TRIPLICATE]	1.8-1.9 m	21/06/21	<4	<0.4	**4**	**4**	**10**	<0.1	**2**	**11**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000	900	3600	240000	1500	730	6000	400000			240	NL			3	NL	NL	230	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
BH2002	0.1-0.2 m	21/06/21	<4	<0.4	**3**	**5**	**7**	<0.1	**4**	**7**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.06**	<0.5	**0.66**	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	**NAD**	-	-	**NAD**	**NAD**
			3000	900	3600	240000	1500	730	6000	400000			240	NL			3	NL	NL	230	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
BH2002	0.9-1 m	21/06/21	<4	<0.4	<1	<1	<1	<0.1	<1	<1	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000	900	3600	240000	1500	730	6000	400000			240	NL			3	NL	NL	230	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
BD1/110321	0.2-0.3 m	11/03/2021	<5	<1	**2**	<5	<5	<0.1	<2	**7**	<10	<50	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000	900	3600	240000	1500	730	6000	400000			240	NL			3	NL	NL	230	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
BD1/300321	1.9-2 m	10/03/2021	<4	<0.4	<1	**2**	**8**	<0.1	<1	**4**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000	900	3600	240000	1500	730	6000	400000			240	NL			3	NL	NL	230	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
BD1/160321	4 - 4.45 m	16/03/2021	<4	<0.4	**1**	<1	<1	<0.1	<1	**6**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			3000	900	3600	240000	1500	730	6000	400000			240	NL			3	NL	NL	230	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
JBSG2019																																														
HA02	0.0-1 m	30/09/2019	**2.4**	<0.4	**8.4**	**14**	**11**	<0.1	**5.4**	**42**	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.3	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**NAD**	**NAD**	**NAD**	-	-	-	-	-
			3000	900	3600	240000	1500	730	6000	400000			240	NL			3	NL	NL	230	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								
HA03	0.0-1 m	30/09/2019	**2.3**	<0.4	**14**	**41**	**18**	<0.1	**8**	**97**	<20	<50	<20	<50	**550**	**110**	<0.1	<0.1	<0.1	<0.3	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	**NAD**	**NAD**	**NAD**	-	-	-	-	-
			3000	900	3600	240000	1500	730	6000	400000			240	NL			3	NL	NL	230	NL	40	4000	660			3600		45	530	100	2000	50	80	2500	3000	2								

Lab result

HIL/HSL value

HIL/HSL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance HSL 0-<1 Exceedance

Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting AD = Asbestos detected NAD = No Asbestos detected

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level ML = Management Limit DC = Direct Contact HSL

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Reported naphthalene laboratory result obtained from BTEXN suite

c Criteria applies to DDT only

Site Assessment Criteria (SAC):

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

SAC based on generic land use thresholds for Commercial/ industrial D

HIL D	Commercial / Industrial (NEPC, 2013)
HSL D	Commercial / Industrial (vapour intrusion) (NEPC, 2013)
DC HSL D	Direct contact HSL D Commercial/industrial (direct contact) (CRC CARE, 2011)
EIL/ESL C/Ind	Commercial and Industrial (NEPC, 2013)
ML C/Ind	Commercial and Industrial (NEPC, 2013)

Douglas Partners
Geotechnics / Environment / Groundwater

Table C2: Summary of Laboratory Results – VOC

			VOC														
			carbon tetrachloride	Monochlorobenzene	Chloroform	1,2-dichlorobenzene	1,4-dichlorobenzene	1,2-dichloroethane	1,1-Dichloroethene	Styrene (vinylbenzene)	1,1,1,2-tetrachloroethane	1,1,2,2-tetrachloroethane	tetrachloroethene	1,1,1-trichloroethane	1,1,2-trichloroethane	1,1,2-trichloroethylene	Vinyl Chloride
		PQL	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
BH1003/0.25-0.3	0 m	10/03/2021	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH1003A/0.8-0.9	0 m	10/03/2021	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH1004/0.6-0.7	0 m	11/03/2021	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
BH1007/0.2-0.3	0 m	11/03/2021	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	HIL/HSL		<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL

Lab result

HIL/HSL value

HIL/HSL exceedance HIL/HSL and EIL/ESL exceedance ML exceedance ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab below the PQL, refer to the lab report **Blue** = DC exceedance

Bold = Lab detections NT = Not tested NL = Non limiting NC = No criteria NA = Not applicable NAD = No asbestos detected

Notes:

	Only samples analysed for VOC included in table
HIL/HSL/DC	NEPC, Schedule B1 - HIL D, HSL D, DC HSL D
ML	NEPC, Schedule B1 - ML C/Ind
a	QA/QC replicate of sample listed directly below the primary sample
b	reported naphthalene laboratory result obtained from BTEXN suite

Table C3: Summary of Results of Groundwater Analysis (All results in µg/L)

Sample ID	Sample Date	Metals (dissolved)									Metals (total)								PAH						TRH									BTEX				PCB			OCP																OPP																
		Arsenic	Cadmium	Chromium (III + VI)	Copper	Lead	Mercury	Nickel	Zinc	Iron	Arsenic	Cadmium	Chromium (III + VI)	Copper	Lead	Mercury	Nickel	Zinc	Iron	Naphthalene	Anthracene	Fluoranthene	Benzo(a)pyrene	Phenanthrene	Total Positive PAH	F 1 ((C6-C10)-BTEX)	TRH >C10-C16 less Naphthalene	TRH C6-C9	TRH C6-C10	C10-C14	TRH >C10-C16	C15-C28	C28-C36	TRH >C16-C34	TRH >C34-C40	Benzene	Toulene	Ethylbenzene	o-xylene	m+p-xylene	Aroclor 1242	Aroclor 1254	Other PCB	Aldrin	Dieldrin	gamma-Chlordane	alpha-Chlordane	pp-DDE	pp-DDT	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Methoxychlor	Other OCP	Azinphos-methyl	Bromophos-ethyl	Chlorpyrifos	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenitrothion	Malathion	Parathion	Methyl Parathion	Other OPP
Assessment Criteria																																																																													
Freshwater Default Guideline Values (DGV) - 95% level species protection [1]		24 as As (III); 13 as As(V)	0.2-0.6 [a]	3.9-9.6 as Cr (III) +, 1.0 as Cr(VI)	1.4	4.4-17.7 [a]	0.60	13.1-33.2 [a]	9.6-24.1 [a]	-	24 as As (III); 13 as As(V)	0.2-0.6 [a]	3.9-9.6 as Cr (III) +, 1.0 as Cr(VI)	1.4	4.4-17.7 [a]	0.60	13.1-33.2 [a]	9.6-24.1 [a]	-	16	0.4*	1.4*	0.2	2.0	-	-	-	-	-	-	-	-	-	-	-	950	180*	80*	350	75 as Xylene (m); 200 as Xylene (p)	0.6	0.03	-	0.001*	0.01*	0.08		-	0.01	0.2		0.02	0.09	-	0.005	-	0.02	-	0.01	0.01	-	0.15	-	0.2	0.05	0.004	-	-
Health Screening Level (HSL) - clay, groundwater 2 m-<4 m / 4 m-<8 m		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	NL	NL	-	-	-	-	-	-	-	30000	NL	NL	NL		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH107A	23/03/21	<1	<0.1	<1	<1	<1	<0.05	12	**25**	78	2	**0.8**	**13**	**13**	13	<0.05	18	**95**	2900	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<10	<50	<10	<10	<50	<50	<100	<100	<100	<100	<1	<1	<1	<1	<2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH107B	23/03/21	<1	<0.1	<1	<1	<1	<0.05	26	7	<10	7	0.2	**41**	**38**	**38**	0.09	**100**	**190**	39000	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<10	<50	<10	<10	<50	<50	120	<100	120	<100	<1	<1	<1	<1	<2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH202	23/03/21	<1	<0.1	<1	<1	<1	<0.05	22	18	3000	2	<0.1	4	5	5	<0.05	4	**42**	7500	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<10	<50	<10	<10	<50	<50	<100	<100	<100	<100	<1	<1	<1	<1	<2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.02	<0.2	<0.009	<0.01	<0.2	<0.15	<0.2	<0.2	<0.05	<0.004	<0.2	<PQL
BH1002	23/03/21	<1	0.2	<1	**2**	<1	<0.05	4	**140**	<10	6	0.3	**20**	**37**	**45**	<0.05	17	**570**	18000	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<10	<50	<10	<10	<50	<50	<100	<100	<100	<100	<1	<1	<1	<1	<2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.02	<0.2	<0.009	<0.01	<0.2	<0.15	<0.2	<0.2	<0.05	<0.004	<0.2	<PQL
BH1003A	23/03/21	<1	<0.1	<1	**18**	<1	<0.05	4	**86**	12	1	0.1	**21**	**31**	13	<0.05	8	**370**	8700	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<10	<50	<10	<10	<50	<50	<100	<100	<100	<100	<1	2	<1	<1	<2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.02	<0.2	<0.009	<0.01	<0.2	<0.15	<0.2	<0.2	<0.05	<0.004	<0.2	<PQL
BH1007	23/03/21	<1	<0.1	<1	<1	<1	<0.05	3	**110**	850	7	**3.9**	**57**	**110**	**81**	0.11	**38**	**4300**	47000	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<10	<50	<10	<10	<50	<50	<100	<100	<100	<100	<1	<1	<1	<1	<2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BD1/230321	23/03/21	<1	0.2	<1	**2**	<1	<0.05	4	**140**	-	-	-	-	-	-	-	-	-	-	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<10	<50	<10	<10	<50	<50	<100	<100	<100	<100	<1	<1	<1	<1	<2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rinsate	23/02/21	<1	<0.1	<1	2	1	<0.05	1	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29	30	-	-	-	-	-	-	<1	<1	<1	<1	<2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

PQL Practical Quantitation Limit

NL Not Limiting

BOLD Exceeds DGV

Table C4: Summary of Results of Groundwater Analysis (All results in µg/L)

Sample ID	Sample Date	VOC																												Other
		Isopropylbenzene	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene	cis-1,3-Dichloropropene	Vinyl chloride	Tetrachloroethene	Trichloroethene	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Chlorobenzene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,2-Dichloroethane	1,1,2,2-Tetrachloroethane	Carbon tetrachloride	Chloroform	Bromodichloromethane	Dibromochloromethane	Bromoform	1,2-Dichloropropane	1,3-Dichloropropane	Other VOC	Cyanide
Assessment Criteria																														
Freshwater Default Guideline Values (DGV) - 95% level species protection [1]		30	-	-	-	-		-	-	-	10	170	160	260	60	-	270 *	6500	1900 *	400*	240*	770 *	-	-	-	900*	1100 *	-	7
Health Screening Level (HSL) - sand, groundwater 2 m-<4 m		-	-	-		-		-	-	-	-		-	-	-	-	-	-	-		-	-				-	-	-	-
Health Screening Level (HSL) - clay, groundwater 2 m-<4 m / 4 m-<8 m		-	-	-		-		-	-	-	-		-	-	-	-	-	-	-		-	-				-	-	-	-
BH107A	23/03/21	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<PQL	-
BH107B	23/03/21	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<PQL	-
BH202	23/03/21	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	11	<1	<1	<1	<1	<1	<PQL	<0.004
BH1002	23/03/21	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<PQL	<0.004
BH1003A	23/03/21	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	6	<1	<1	<1	<1	<1	<PQL	<0.004
BH1007	23/03/21	<1	<1	<1	<1	<1	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	4	<1	<1	<1	<1	<1	<PQL	-
BD1/230321	23/03/21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

PQL	Practical Quantitation Limit
NL	Not Limiting
BOLD	Exceeds DGV
-	not defined/not analysed/not applicable

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Table C5: Summary of Laboratory Results – Metals, TRH, BTEX, PAH, Phenol, OCP, OPP, PCB, Asbestos, VOC

				Metals										TRH					BTEX					
				Arsenic	Cadmium	Total Chromium	Copper	Lead	Lead TCLP	Mercury (inorganic)	Nickel	Nickel TCLP	Zinc	TRH C6 - C9	TRH C10 - C14	TRH C15 - C28	TRH C29 - C36	C10-C36 recoverable hydrocarbons	Benzene	Toluene	Ethylbenzene	m+p-Xylene	o-Xylene	Xylenes (total)
		PQL		4	0.4	1	1	1	0.03	0.1	1	0.02	1	25	50	100	100	50	0.2	0.5	1	2	1	3
Sample ID	Depth (m)	Sample Date	Material Type	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
BH1001	0.25 - 0.3	12/03/2021	Fill	<4	<0.4	**4**	**13**	**11**	-	<0.1	**4**	-	**16**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
BH1001	0.5 - 0.6	12/03/2021	Natural	**6**	<0.4	**7**	**4**	**7**	-	<0.1	<1	-	**5**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
BH1002	0.25 - 0.35	11/03/2021	Fill	<4	<0.4	**6**	**20**	**13**	-	<0.1	**4**	-	**28**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
BH1002	0.35 - 0.5	11/03/2021	Natural	<4	<0.4	**6**	**3**	**4**	-	<0.1	<1	-	**6**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
BH1003	0.25 - 0.3	10/03/2021	Fill	<4	<0.4	**6**	**17**	**40**	-	**0.2**	**4**	-	**37**	<25	<50	**120**	<100	**170**	<0.2	<0.5	<1	<2	<1	<3
BH1003A	0.8 - 0.9	10/03/2021	Fill	<4	<0.4	**7**	**8**	**32**	-	**0.2**	**2**	-	**35**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
BH1003A	1.9 - 2.0	10/03/2021	Natural	<4	<0.4	<1	<1	**1**	-	<0.1	<1	-	**4**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
BH1004	0.3 - 0.4	11/03/2021	Fill	<4	<0.4	**8**	**37**	**72**	-	**0.5**	**6**	-	**82**	<25	<50	**110**	<100	**170**	<0.2	<0.5	<1	<2	<1	<3
BH1004	0.6 - 0.7	11/03/2021	Fill	<4	<0.4	**6**	**12**	**75**	-	**0.3**	**3**	-	**38**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
BH1004A	3.1 - 3.55	17/03/2021	Natural	<4	<0.4	**2**	**6**	**5**	-	<0.1	**2**	-	**48**	<25	**320**	**130**	**140**	**590**	<0.2	<0.5	<1	<2	<1	<3
BH1005	0.22 - 0.3	11/03/2021	Fill	<4	<0.4	**7**	**29**	**59**	-	**0.3**	**6**	-	**68**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
BH1005	0.5 - 0.6	11/03/2021	Fill	**5**	<0.4	**8**	**27**	**66**	-	**0.3**	**4**	-	**74**	<25	<50	**120**	**100**	**200**	<0.2	<0.5	<1	<2	<1	<3
BH1005	1.55 - 1.65	11/03/2021	Fill	<4	<0.4	**9**	**37**	**210**	**0.36**	**0.7**	**6**	-	**150**	<25	<50	**240**	**120**	**320**	<0.2	<0.5	<1	<2	<1	<3
BH1005	2.8 - 2.95	15/03/2021	Natural	<4	<0.4	**3**	**4**	**15**	-	<0.1	**1**	-	**14**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
BH1007	0.2 - 0.3	11/03/2021	Fill	<4	<0.4	**9**	**24**	**53**	-	**0.3**	**7**	-	**50**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
BH1007	2 - 2.1	16/03/2021	Fill	<4	<0.4	**11**	**23**	**51**	-	**0.2**	**3**	-	**49**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
BH1007	2.5 - 2.95	16/03/2021	Fill	<4	<0.4	**4**	**2**	**8**	-	<0.1	**1**	-	**11**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
BH1007	4..0- 4.45	16/03/2021	Natural	<4	<0.4	**1**	<1	<1	-	<0.1	<1	-	**4**	<25	**76**	<100	<100	**80**	<0.2	<0.5	<1	<2	<1	<3
BD3/100321	1.9 - 2.0	10/03/2021	Natural	<4	<0.4	<1	**2**	**8**	-	<0.1	<1	-	**4**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
BD1/110321	0.2 - 0.3	11/03/2021	Fill	<5	<1	**2**	<5	<5	-	<0.1	<2	-	**7**	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5
BD1/160321	4..0- 4.45	16/03/2021	Natural	<4	<0.4	**1**	<1	<1		<0.1	<1	-	**6**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<3
BH2001A	0.15-0.2 m	21/06/21	Fill	<4	<0.4	**22**	**32**	**11**	-	<0.1	**49**	**0.06**	**33**	<25	<50	<100	<100	-	<0.2	<0.5	<1	<2	<1	<3
BH2001A	1.8-1.9 m	21/06/21	Fill	<4	<0.4	**4**	**4**	**12**	-	<0.1	**2**	-	**13**	<25	<50	<100	<100	-	<0.2	<0.5	<1	<2	<1	<3
BH2001A	1-1.1 m	21/06/21	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH2002	0.1-0.2 m	21/06/21	Fill	<4	<0.4	**3**	**5**	**7**	-	<0.1	**4**	-	**7**	<25	<50	<100	<100	-	<0.2	<0.5	<1	<2	<1	<3
BH2002	0.9-0.1 m	21/06/21	Natural	<4	<0.4	<1	<1	<1	-	<0.1	<1	-	<1	<25	<50	<100	<100	-	<0.2	<0.5	<1	<2	<1	<3
BH2001A - [TRIPLICATE]	1.8-1.9 m	21/06/21	Fill	<4	<0.4	**4**	**4**	**10**	-	<0.1	**2**	-	**11**	-	-	-	-	-	-	-	-	-	-	-
HA02	0-0.1 m	30/09/2019	Fill	**2.4**	<0.4	**8.4**	**14**	**11**	-	<0.1	**5.4**	-	**42**	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
HA03	0-0.1 m	30/09/2019	Fill	**2.3**	<0.4	**14**	**41**	**18**	-	<0.1	**8**	-	**97**	<20	<20	**450**	**190**	**640**	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
Waste Classification Criteria [f]																								
CT1				100	20	100	NC	100	N/A	4	40	NC	NC	650	NC	NC	NC	10000	10	288	600	NC	NC	1000
SCC1				500	100	1900	NC	1500	N/A	50	1050	1050	NC	650	NC	NC	NC	10000	18	518	1080	NC	NC	1800
TCLP1				N/A	1	N/A	NC	N/A	5	N/A	N/A	2	NC	N/A	NC	NC	NC	N/A	0.5	N/A	N/A	NC	NC	N/A
CT2				400	80	400	NC	400	N/A	16	160	NC	NC	2600	NC	NC	NC	40000	40	1152	2400	NC	NC	4000
SCC2				2000	400	7600	NC	6000	N/A	200	4200	4200	NC	2600	NC	NC	NC	40000	72	2073	4320	NC	NC	7200
TCLP2				N/A	4	N/A	NC	N/A	20	N/A	N/A	8	NC	N/A	NC	NC	NC	N/A	2	N/A	N/A	NC	NC	N/A
ENM Order (2014) Maximum Average Concentration				20	0.5	75	NC	100	NC	0.5	30	NC	NC	NC	NC	NC	NC	250	NC	NC	NC	NC	NC	NC
ENM Order (2014) Absolute Maximum Concentration				40	1	150	NC	200	NC	1	60	NC	NC	NC	NC	NC	NC	500	0.5	65	25	NC	NC	NC

CT1 exceedance | TCLP1 and/or SCC1 exceedance | CT2 exceedance | TCLP2 and/or SCC2 exceedance | Asbestos detection | ENMOrder 2014

NT = Not tested NL = Non limiting NC = No criteria NA = Not applicable

Notes:

a	QA/QC replicate of sample listed directly below the primary sample
b	Total chromium used as initial screen for chromium(VI).
c	Total recoverable hydrocarbons (TRH) used as an initial screen for total petroleum hydrocarbons (TPH)
d	Criteria for scheduled chemicals used as an initial screen
e	Criteria for Chlorpyrifos used as initial screen
f	All criteria are in the same units as the reported results
PQL	Practical quantitation limit
CT1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: General solid waste
SCC1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste
TCLP1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste
CT2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: Restricted solid waste
SCC2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste
TCLP2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste

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Table C5: Summary of Laboratory Results – MTable A1: Summary of Laboratory Results – Metals, TRH, BTEX, PAH, Phenol, OCP, OPP, PCB, Asbestos, VOC

				PAH						Phenol	OCP		OPP	PCB	Asbestos				Total VOC
				Benzo(a)pyrene (BaP)	Benzo(a)pyrene (BaP) TCLP	Naphthalene	Naphthalene TCLP	Total PAHs	Total PAHs TCLP	Phenol	Total Endosulfan	Total Analysed OCP	Total Analysed OPP	Total Analysed PCB	Trace Analysis	Asbestos ID in soil <0.1g/kg	Asbestos (50 g)	FA and AF Estimation	
		PQL		0.05	0.001	1	0.001	0.05	-	5	0.1	0.1	0.1	0.1	-	<0.1	-	<0.001	1
Sample ID	Depth (m)	Sample Date	Material Type	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	g/kg	-	%(w/w)	mg/kg
BH1001	0.25 - 0.3	12/03/2021	Fill	**0.1**	-	<1	-	**0.73**	-	<5	<0.1	<0.1	<0.1	<0.1	NAD	-	NAD	-	-
BH1001	0.5 - 0.6	12/03/2021	Natural	<0.05	-	<1	-	<0.05	-	-	-	-	-	-	NAD	-	NAD	-	-
BH1002	0.25 - 0.35	11/03/2021	Fill	**0.1**	-	<1	-	**0.65**	-	-	-	-	-	-	NAD	-	NAD	-	-
BH1002	0.35 - 0.5	11/03/2021	Natural	<0.05	-	<1	-	<0.05	-	-	-	-	-	-	NAD	-	NAD	-	-
BH1003	0.25 - 0.3	10/03/2021	Fill	**0.94**	<0.001	<1	<0.001	**9.3**	**NIL(+)VE**	<5	<0.1	<0.1	<0.1	<0.1	NAD	<0.1	-	<0.001	<PQL
BH1003A	0.8 - 0.9	10/03/2021	Fill	**0.73**	-	<1	-	**8.9**	-	<5	<0.1	<0.1	<0.1	<0.1	NAD	<0.1	-	<0.001	<PQL
BH1003A	1.9 - 2.0	10/03/2021	Natural	<0.05	-	<1	-	<0.05	-	-	-	-	-	-	NAD	-	NAD	-	-
BH1004	0.3 - 0.4	11/03/2021	Fill	**2.9**	<0.001	<1	<0.001	**34**	**NIL(+)VE**	<5	<0.1	<0.1	<0.1	<0.1	NAD	-	NAD	-	-
BH1004	0.6 - 0.7	11/03/2021	Fill	**1.2**	-	<1	-	**15**	-	-	-	-	-	-	NAD	-	NAD	-	<PQL
BH1004A	3.1 - 3.55	17/03/2021	Natural	<0.05	-	<1	-	<0.05	-	-	-	-	-	-	-	-	-	-	-
BH1005	0.22 - 0.3	11/03/2021	Fill	**1.2**	-	<1	-	**11**	-	-	-	-	-	-	NAD	-	NAD	-	-
BH1005	0.5 - 0.6	11/03/2021	Fill	**2.7**	<0.001	<1	<0.001	**33**	**0.001**	<5	<0.1	<0.1	<0.1	<0.1	NAD	-	NAD	-	-
BH1005	1.55 - 1.65	11/03/2021	Fill	**8.4**	<0.001	**9**	**0.097**	**160**	**0.25**	-	-	-	-	-	NAD	-	NAD	-	-
BH1005	2.8 - 2.95	15/03/2021	Natural	**0.54**	-	<1	-	**7**	-	-	-	-	-	-	-	-	-	-	-
BH1007	0.2 - 0.3	11/03/2021	Fill	**0.3**	-	<1	-	**2.7**	-	<5	<0.1	<0.1	<0.1	<0.1	NAD	<0.1	-	<0.001	<PQL
BH1007	2 - 2.1	16/03/2021	Fill	**1.5**	<0.001	<1	**0.27**	**17**	**3.8**	-	-	-	-	-	NAD	AD	-	0.0016	-
BH1007	2.5 - 2.95	16/03/2021	Fill	**0.2**	-	<1	-	**3.5**	-	<5	<0.1	<0.1	<0.1	<0.1	NAD	-	NAD	-	-
BH1007	4..0- 4.45	16/03/2021	Natural	<0.05	-	<1	-	<0.05	-	-	-	-	-	-	-	-	-	-	-
BD3/100321	1.9 - 2.0	10/03/2021	Natural	<0.05	-	<1	-	<0.05	-	-	-	-	-	-	-	-	-	-	-
BD1/110321	0.2 - 0.3	11/03/2021	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BD1/160321	4..0- 4.45	16/03/2021	Natural	<0.05	-	<1	-	<0.05	-	-	-	-	-	-	-	-	-	-	-
BH2001A	0.15-0.2 m	21/06/21	Fill	<0.05	-	<1	-	<0.05	-	-	-	-	-	-	NAD	<0.1	-	<0.001	-
BH2001A	1.8-1.9 m	21/06/21	Fill	**0.65**	<0.01	<1	-	**7.2**	**NIL(+)VE**	<5	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-
BH2001A	1-1.1 m	21/06/21	Fill	-	-	-	-	-	-	-	-	-	-	-	NAD	<0.1	-	<0.001	-
BH2002	0.1-0.2 m	21/06/21	Fill	**0.06**	-	<1	-	**0.66**	-	<5	<0.1	<0.1	<0.1	<0.1	NAD	<0.1	-	<0.001	-
BH2002	0.9-0.1 m	21/06/21	Natural	<0.05	-	<1	-	<0.05	-	-	-	-	-	-	-	-	-	-	-
BH2001A - [TRIPLICATE]	1.8-1.9 m	21/06/21	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA02	0-0.1 m	30/09/2019	Fill	<0.5	-	<0.5	-	<0.5	-	-	-	-	-	-	NAD	-	NAD	-	-
HA03	0-0.1 m	30/09/2019	Fill	<0.5	-	<0.5	-	<0.5	-	-	<0.05	<0.1	-	<0.1	NAD	-	NAD	-	-
HA02	0-0.1 m	30/09/2019	Fill	<0.5	-	<0.5	-	<0.5	-	-	-	-	-	-	NAD	-	NAD	-	-
HA03	0-0.1 m	30/09/2019	Fill	<0.5	-	<0.5	-	<0.5	-	-	<0.05	<0.1	-	<0.1	NAD	-	NAD	-	-
CT1				0.8	N/A	NC	NC	200	N/A	288	60	<50	4	<50	NAD	NAD	NAD	NAD	N/A
SCC1				10	N/A	NC	NC	200	N/A	518	108	<50	7.5	<50	NAD	NAD	NAD	NAD	N/A
TCLP1				N/A	0.04	NC	NC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NAD	NAD	NAD	NAD	N/A
CT2				3.2	N/A	NC	NC	800	N/A	1152	240	<50	16	<50	NAD	NAD	NAD	NAD	N/A
SCC2				23	N/A	NC	NC	800	N/A	2073	432	<50	30	<50	NAD	NAD	NAD	NAD	N/A
TCLP2				N/A	0.16	NC	NC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NAD	NAD	NAD	NAD	N/A
ENM Order (2014) Maximum Average Concentration				N/A	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NAD	NAD	NAD	NAD	N/A
ENM Order (2014) Absolute Maximum Concentration				N/A	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NAD	NAD	NAD	NAD	N/A

CT1 exceedance | TCLP1 and/or SCC1 exceedance | CT2 exceedance | TCLP2 and/or SCC2 exceedance | Asbestos detection | ENMOrder 2014

NT = Not tested NL = Non limiting NC = No criteria NA = Not applicable

Notes:

a	QA/QC replicate of sample listed directly below the primar
b	Total chromium used as initial screen for chromium(VI).
c	Total recoverable hydrocarbons (TRH) used as an initial s
d	Criteria for scheduled chemicals used as an initial screen
e	Criteria for Chlorpyrifos used as initial screen
f	All criteria are in the same units as the reported results
PQL	Practical quantitation limit
CT1	NSW EPA, 2014, Waste Classification Guidelines Part 1;
SCC1	NSW EPA, 2014, Waste Classification Guidelines Part 1;
TCLP1	NSW EPA, 2014, Waste Classification Guidelines Part 1;
CT2	NSW EPA, 2014, Waste Classification Guidelines Part 1;
SCC2	NSW EPA, 2014, Waste Classification Guidelines Part 1;
TCLP2	NSW EPA, 2014, Waste Classification Guidelines Part 1;

Notes:

a	QA/QC replicate of sample listed directly below the primary sample
b	Total chromium used as initial screen for chromium(VI).
c	Total recoverable hydrocarbons (TRH) used as an initial screen for total petroleum hydrocarbons (TPH)
d	Criteria for scheduled chemicals used as an initial screen
e	Criteria for Chlorpyrifos used as initial screen
f	All criteria are in the same units as the reported results
PQL	Practical quantitation limit
CT1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: General solid waste
SCC1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste
TCLP1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste
CT2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: Restricted solid waste
SCC2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste
TCLP2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste

Appendix D

Field Work Methodology

Appendix D
Filed Work Methodology
Detailed Site Investigation (Contamination)
2-8a Lee Street, Haymarket

D1.0 Guidelines

The following key guideline was consulted for the field work methodology:

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013).

D2.0 Soil Sampling

Soil sampling is carried out in accordance with DP standard operating procedures. The general sampling and sample management procedures comprise:

- Collection of soil samples from all locations at the surface (where no pavement present), and then at regular intervals based on field observations, such as soil type and signs of potential concern;
- Transfer samples in laboratory-prepared glass jars with Teflon lined lids by hand, capping immediately and minimising headspace within the sample jar;
- Collect replicate samples in zip-lock bags for PID screening;
- Transfer of samples for asbestos analysis into snap-lock bags or laboratory-prepared glass jars. Approximate volumes of 40g or 500 mL will be collected as required for the proposed analysis;
- Wear a new disposable nitrile glove for each sample point thereby minimising potential for cross-contamination;
- Collect 10% replicate samples for QC purposes;
- Label sample containers with individual and unique identification details, including project number, sample location and sample depth (where applicable);
- Place samples into a cooled, insulated and sealed container for transport to the laboratory; and
- Use chain-of-custody documentation.

D2.1 Field Testing

Field testing is carried out in accordance with DP standard operating procedures. The general sampling and sample management procedures comprise:

PID Field Test

- Calibrate the PID with isobutylene gas at 100 ppm and with fresh air prior to commencement of each successive day's field work;
- Allow the headspace in the PID zip-lock bag samples to equilibrate; and
- Screen using the PID.

Assessment of Subsurface ACM

- Collect at least one bulk (~10 L) soil sample;
- Weigh each bulk sample;
- Screen each bulk sample through a ≤7 mm aperture sieve;
- Weigh all retrieved potential ACM fragments; and
- Calculate the asbestos concentration (% w/w) in soil as per the procedure described in NEPC (2013).

D3.0 Groundwater Sampling

D3.1 Monitoring Well Installation

Monitoring wells are constructed using class 18 uPVC machine slotted screen and blank sections with screw threaded joints. The screened section of each well is backfilled with a washed sand filter pack to approximately 0.5 m above the screened interval. Each well is completed with a hydrated bentonite plug of at least 0.5 m thick and then bentonite to the surface, finished as a gatic cover at the surface.

D3.2 Monitoring Well Development

Groundwater monitoring wells are developed as soon as practicable following well installation. The purpose of well development is to remove sediments and/or drilling fluid introduced to the well during drilling and to facilitate connection of the monitoring well to the aquifer. The wells are developed by pumping / bailing to remove a minimum of five well volumes, or until dry.

D3.3 Groundwater Sampling

Peristaltic Pump

Groundwater sampling is carried out in accordance with DP standard operating procedures. Groundwater samples are collected using a low flow peristaltic pump via the micro-purge (minimal drawdown) method. The sampling method is described as follows:

- Measure the static water level using an electronic interface probe and record the thickness of any LNAPL (if encountered);
- Decontaminate the interface probe and cable between monitoring wells by rinsing in a diluted Decon-90 / Liquinox solution and then rinsing in demineralised water;
- Lower the well-dedicated tubing into the well then clamped at a level estimated to be 1 m below the top of the water column (provided the depth of the pump is within the screened section) or to the approximate mid-point of the well screen;
- Set the pump at the lowest rate possible to minimise drawdown of the water column;
- Measure physical parameters by continuously passing the purged water through a flow cell; and
- Following stabilisation of the field parameters, collect samples in laboratory-prepared bottles minimising headspace within the sample bottle and cap immediately.

Bailer

Groundwater sampling is carried out in accordance with DP standard operating procedures. Groundwater samples are collected using a well-dedicated bailer via the well stress / well-purge method. The sampling method is described as follows:

- Measure the static water level using an electronic interface probe and record the thickness of any LNAPL (if encountered);
- Decontaminate the interface probe and cable between monitoring wells by rinsing in a diluted Decon-90 / Liquinox solution and then rinsing in demineralised water;
- Estimate the volume of groundwater in the well, including the annulus and purge at least three well volumes from the well (or purge until dry);
- Measure physical parameters by continuously passing the purged water through a flow cell and record a stabilised reading (if possible) after stagnant water has been removed from the well; and
- Collect samples in laboratory-prepared bottles minimising headspace within the sample bottle and cap immediately.

Sample Handling, All Methods

The general groundwater sample handling and management procedures comprise:

- Collect 10% replicate samples for QC purposes;
- Label sample containers with individual and unique identification details, including project number and sample location;
- Place the sample jars into a cooled, insulated and sealed container for transport to the laboratory; and

- Use chain-of-custody documentation.

D4.0 References

HEPA. (2020). *PFAS National Environmental Management Plan (NEMP).* Version 2.0: Heads of EPAs Australia and New Zealand and Australian Government Department of the Environment.

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM].* Australian Government Publishing Services Canberra: National Environment Protection Council.

Douglas Partners Pty Ltd

Appendix E

Borehole Logs

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 13.4 m AHD
EASTING: 333923
NORTHING: 6249301
DIP/AZIMUTH: 90°/--

BORE No: BH1001
PROJECT No: 86884.02
DATE: 12/3/2021
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
		CONCRETE SLAB										
	0.24	FILL/GRAVEL: coarse, brown, with fine to coarse sand, apparently in loose to medium dense condition							A/E*			PID<1ppm
13	0.35	Silty CLAY CI-CH: medium to high plasticity, orange-brown, trace fine to medium ironstone gravel and fine sand, w~PL (affected by diatube), apparently firm to stiff, residual soil							A/E			PID<1ppm
	1								A/E			PID<1ppm
12		Below 1.2m: relict rock texture, extremely weathered sandstone (Mittagong Formation)							C	100	20	
	1.54	SANDSTONE: medium grained, red-brown, orange-brown and pale grey, bedded at 0°-20°, with ironstone bands, very low strength to low to medium strength, highly weathered, fractured, Mittagong Formation						1.59m: B0°, pl, ro, cly vn 1.7m: CORE LOSS: 80mm				PL(A) = 0.3
	1.78 1.87							1.87m: B0°, pl, ro, cly co 2mm				PL(A) = 0.8
	2	SANDSTONE: medium to coarse grained, orange-brown and pale grey, bedded at 0°-20°, with ironstone bands, medium strength, highly weathered, fractured, Hawkesbury Sandstone						2.20-2.55m: J70°-80°, cu, ro, cbs	C	92	84	
11		Below 2.7m: moderately to slightly weathered						2.56m: Cs, 20mm 2.62m: B0°, pl, ro, cly co 15mm 2.68m: B0°, pl, ro, cly co 15mm 2.7m: B0°, pl, ro, cly co 5mm 2.93m: B0-5°, un, ro, fe stn 2.95 & 2.96m: B5-10° (x2), un, ro, fe stn				PL(A) = 0.7
	3 3.0	SANDSTONE: medium to coarse grained, pale grey, cross-bedded at 0°-20°, with 20% fine grained, grey to dark grey sandstone laminations and 5-10% carbonaceous laminations and flecks, medium to high strength, fresh, slightly fractured to unbroken, Hawkesbury Sandstone							C	100	98	PL(A) = 0.8
10												PL(A) = 0.8
	4								C	100	100	
9												PL(A) = 1.3

RIG: XC Drill **DRILLER:** Terratest **LOGGED:** IT **CASING:** HWT to 1.2m

TYPE OF BORING: Diatube (200mm dia.) to 0.24m, Solid Flight Auger (TC-bit) 0.24-1.2m, NMLC Coring 1.2-14.22m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: *Field replicate BD2/120312 collected from 0.25-0.3m

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▽	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 13.4 m AHD
EASTING: 333923
NORTHING: 6249301
DIP/AZIMUTH: 90°/--

BORE No: BH1001
PROJECT No: 86884.02
DATE: 12/3/2021
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
		SANDSTONE: medium to coarse grained, pale grey, cross-bedded at 0°-20°, with 20% fine grained, grey to dark grey sandstone laminations and 5-10% carbonaceous laminations and flecks, medium to high strength, fresh, slightly fractured to unbroken, Hawkesbury Sandstone *(continued)*							C	100	100	
								5.6m: B0°-5°, un, ro, cbs 5.75m: B0°-5°, un, ro, cbs 5.88m: B5°-10°, un, ro, cbs	C	100	100	PL(A) = 1.3
								6.72m: B0°, pl, un, cly vn				PL(A) = 1
									C	100	100	PL(A) = 1
								>>				
									C	100	100	PL(A) = 0.7
									C	100	100	PL(A) = 1.3

RIG: XC Drill **DRILLER:** Terratest **LOGGED:** IT **CASING:** HWT to 1.2m

TYPE OF BORING: Diatube (200mm dia.) to 0.24m, Solid Flight Auger (TC-bit) 0.24-1.2m, NMLC Coring 1.2-14.22m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: *Field replicate BD2/120312 collected from 0.25-0.3m

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
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BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 13.4 m AHD
EASTING: 333923
NORTHING: 6249301
DIP/AZIMUTH: 90°/--

BORE No: BH1001
PROJECT No: 86884.02
DATE: 12/3/2021
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
3		SANDSTONE: medium to coarse grained, pale grey, cross-bedded at 0°-20°, with 20% fine grained, grey to dark grey sandstone laminations and 5-10% carbonaceous laminations and flecks, medium to high strength, fresh, slightly fractured to unbroken, Hawkesbury Sandstone *(continued)*						10.33m: B0°, pl, ro, cly co 5mm	C	100	100	
	11											PL(A) = 1
2								11.27m: B0°-5°, pl, ro, cly vn				
	12								C	100	100	PL(A) = 0.7
1								12.5m: B0°, pl, ro, cly co 2mm				
	13											PL(A) = 1.5
0									C	100	95	
								13.66m: B10°, pl, ro, cly vn				PL(A) = 1.2
	14											
	14.22	Bore discontinued at 14.22m - Target depth reached						14.15m: B0°-5°, pl, ro, cly vn				
-1												

RIG: XC Drill **DRILLER:** Terratest **LOGGED:** IT **CASING:** HWT to 1.2m

TYPE OF BORING: Diatube (200mm dia.) to 0.24m, Solid Flight Auger (TC-bit) 0.24-1.2m, NMLC Coring 1.2-14.22m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: *Field replicate BD2/120312 collected from 0.25-0.3m

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 13.4 m AHD
EASTING: 333935
NORTHING: 6249290
DIP/AZIMUTH: 90°/--

BORE No: BH1002
PROJECT No: 86884.02
DATE: 11/3/2021
SHEET 1 OF 4

RL	Depth (m)	Description of Strata	Degree of Weathering	Graphic Log	Rock Strength	Water	Fracture Spacing (m)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
		CONCRETE SLAB										
	0.24	FILL/MIXTURE OF GRAVEL and BRICKS: coarse sandstone gravel and bricks, brown, apparently in loose to medium dense condition							A/E			PID<1ppm
	0.35								A/E			PID<1ppm
	0.53	Sandy CLAY CI: medium plasticity, pale grey with pale brown, with fine sandstone gravel and silt, w~PL (affected by diatube), apparently very stiff, extremely weathered sandstone (Mittagong Formation)						0.53m: Cs, 30mm (sandy clay) 0.63m: Cs, 40mm	C	100	60	PL(A) = 0.1
	0.67							0.82m: B0°, pl, ro, cly vn 0.87m: B0°, pl, ro, cly vn				PL(A) = 0.2
13	1	SANDSTONE: medium grained, orange-brown and pale grey, bedded at 0°-10°, highly weathered, very low to low strength, fractured, Mittagong Formation						1.17m: B0°, pl, ro, fe stn 1.19m: J10°-20°, un, ro, fe stn 1.21m: Cs, 40mm (with ironstone gravel)	C	100	95	PL(A) = 1.1
12		SANDSTONE: medium to coarse grained, red-brown and orange-brown with some pale grey, with ironstone bands, distinct and indistinct bedding at 0°-10°, highly weathered, high strength with very low strength bands, slightly fractured, Hawkesbury Sandstone										PL(A) = 0.4
	2	Below 1.67m: orange-brown and pale grey, moderately weathered to slightly weathered						1.88m: B10°, pl, ro, cly vn	C	100	100	PL(A) = 1.9
11								2.29m: B10°, pl, ro, cly vn				PL(A) = 0.6
	3							2.56 & 2.58m: B0-5° (x2), un, ro, cly co 2mm 2.62m: J20°, un, ti 2.67m: B5°-10°, pl, ti 2.77m: B5°, pl, ro, cly vn 2.8m: B5°-10°, pl, ro, cly vn 2.81m: B5°-10°, pl, ro, cly vn 2.82-3.00m: J80°, pl, ro, fe stn, partially ti	C	100	86	PL(A) = 0.5
10	3.0	SANDSTONE: medium to coarse grained, pale grey, cross-bedded at 10°-20°, with 20% fine grained, grey to dark grey sandstone laminations, medium or high strength, slightly weathered, slightly fractured to unbroken, Hawkesbury Sandstone										
	4											PL(A) = 1.1
9		Below 4.36m: grading to fresh						4.36m: B5°, pl, ro, fe stn 4.39m: B5°, pl, ro, cly vn	C	100	98	PL(A) = 0.6
												PL(A) = 1.2

RIG: XC Drill **DRILLER:** Terratest **LOGGED:** IT **CASING:** HWT to 0.5m

TYPE OF BORING: Diatube (200mm dia.) to 0.24m, Solid Flight Auger (TC-bit) 0.24-0.53m, NMLC Coring 0.53-18.1m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: *Field replicate BD1/110311 collected from 0.35-0.5m; Groundwater well installed: blank PVC 0.0-1.5m, screen PVC 1.5-18.0m, bentonite 0.0-1.3m, gravel 1.3-18.0m, backfill 18.0-18.1m, gatic cover at the surface; 100% water loss from 16.0-18.1m

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 13.4 m AHD
EASTING: 333935
NORTHING: 6249290
DIP/AZIMUTH: 90°/--

BORE No: BH1002
PROJECT No: 86884.02
DATE: 11/3/2021
SHEET 2 OF 4

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
8		SANDSTONE: medium to coarse grained, pale grey, cross-bedded at 10°-20°, with 20% fine grained, grey to dark grey sandstone laminations, medium or high strength, slightly weathered, slightly fractured to unbroken, Hawkesbury Sandstone *(continued)*						5.2m: B5°, un, ro, cly vn	C	100	98	
		Below 5.2m: distinct and indistinct bedding at 0°-20°, with 5-10% carbonaceous laminations and flecks										
	6							5.91m: Cz, 50mm 5.96m: B10°, pl, un, cly vn				PL(A) = 0.7
7									C	100	97	
	7											PL(A) = 1.7
6												PL(A) = 1.3
								7.66m: B0°-5°, pl, ro, cbs	C	100	100	
	8											PL(A) = 1.2
5								8.29m: B5°, pl, ro, cbs				PL(A) = 1.1
	9											PL(A) = 1
4									C	100	100	
												PL(A) = 1.6

RIG: XC Drill **DRILLER:** Terratest **LOGGED:** IT **CASING:** HWT to 0.5m

TYPE OF BORING: Diatube (200mm dia.) to 0.24m, Solid Flight Auger (TC-bit) 0.24-0.53m, NMLC Coring 0.53-18.1m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: *Field replicate BD1/110311 collected from 0.35-0.5m; Groundwater well installed: blank PVC 0.0-1.5m, screen PVC 1.5-18.0m, bentonite 0.0-1.3m, gravel 1.3-18.0m, backfill 18.0-18.1m, gatic cover at the surface; 100% water loss from 16.0-18.1m

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 13.4 m AHD
EASTING: 333935
NORTHING: 6249290
DIP/AZIMUTH: 90°/--

BORE No: BH1002
PROJECT No: 86884.02
DATE: 11/3/2021
SHEET 3 OF 4

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
3		SANDSTONE: medium to coarse grained, pale grey, cross-bedded at 10°-20°, with 20% fine grained, grey to dark grey sandstone laminations, medium or high strength, slightly weathered, slightly fractured to unbroken, Hawkesbury Sandstone *(continued)*						10.12m: B5°-10°, un, ro, cly vn				
2	11							10.82m: B0°, pl, ro, cly vn	C	100	100	PL(A) = 1.3
1	12							12.33m: B20°, pl, ro, cbs 12.48m: B5°, pl, ro, cly co 5mm	C	100	100	PL(A) = 0.8 PL(A) = 0.8
0	13								C	100	95	PL(A) = 1.4
-1	14							14.12m: B0°-5°, un, ro, cbs 14.19m: B5°, pl, ro, cly co 5mm	C	100	100	PL(A) = 2.6

RIG: XC Drill **DRILLER:** Terratest **LOGGED:** IT **CASING:** HWT to 0.5m

TYPE OF BORING: Diatube (200mm dia.) to 0.24m, Solid Flight Auger (TC-bit) 0.24-0.53m, NMLC Coring 0.53-18.1m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: *Field replicate BD1/110311 collected from 0.35-0.5m; Groundwater well installed: blank PVC 0.0-1.5m, screen PVC 1.5-18.0m, bentonite 0.0-1.3m, gravel 1.3-18.0m, backfill 18.0-18.1m, gatic cover at the surface; 100% water loss from 16.0-18.1m

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 13.4 m AHD
EASTING: 333935
NORTHING: 6249290
DIP/AZIMUTH: 90°/--

BORE No: BH1002
PROJECT No: 86884.02
DATE: 11/3/2021
SHEET 4 OF 4

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-2		SANDSTONE: medium to coarse grained, pale grey, cross-bedded at 10°-20°, with 20% fine grained, grey to dark grey sandstone laminations, medium or high strength, slightly weathered, slightly fractured to unbroken, Hawkesbury Sandstone *(continued)*						15.16m: B0°-5°, un, ro, cly vn	C	100	100	
	16											PL(A) = 1.2
-3						19-03-21		16.19m: B20°, pl, ro, cly vn				PL(A) = 1.3
									C	100	100	
								16.86m: B10°, un, ti				
	17	Between 17.10-17.35m: siltstone clasts, up to 10mm						17.11m: B5°-10°, un, ro, cly vn 17.23m: fg/Cz, 70mm				PL(A) = 0.8
-4								17.43m: B0°, pl, ro, cly vn 17.55-17.80m: F80°, pl, ti, <5mm displacement	C	100	87	
	18							17.92-18.10m: J80°, pl, ro, cln				
	18.1	Bore discontinued at 18.1m - Target depth reached										
-5												
	19											
-6												

RIG: XC Drill **DRILLER:** Terratest **LOGGED:** IT **CASING:** HWT to 0.5m

TYPE OF BORING: Diatube (200mm dia.) to 0.24m, Solid Flight Auger (TC-bit) 0.24-0.53m, NMLC Coring 0.53-18.1m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: *Field replicate BD1/110311 collected from 0.35-0.5m; Groundwater well installed: blank PVC 0.0-1.5m, screen PVC 1.5-18.0m, bentonite 0.0-1.3m, gravel 1.3-18.0m, backfill 18.0-18.1m, gatic cover at the surface; 100% water loss from 16.0-18.1m

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 13.4 m AHD
EASTING: 333935
NORTHING: 6249290
DIP/AZIMUTH: 90°/--

BORE No: BH1002
PROJECT No: 86884.02
DATE: 11/3/2021
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
13.4	0.24	CONCRETE SLAB							
13.1	0.35	FILL/MIXTURE OF GRAVEL and BRICKS: coarse sandstone gravel and bricks, brown, apparently in loose to medium dense condition		A/E	0.25 0.35		PID<1ppm PID<1ppm		
12.9	0.53			A/E	0.5		PL(A) = 0.1		
12.8	0.67	Sandy CLAY CI: medium plasticity, pale grey with pale brown, with fine sandstone gravel and silt, w~PL (affected by diatube), apparently very stiff, extremely weathered sandstone (Mittagong Formation)			0.57				Bentonite 0.0-1.3m
12.4	1			A/E	0.9 0.91		PL(A) = 0.2		
				C	1.0 1.18		PL(A) = 1.1		
11.9		SANDSTONE: medium grained, orange-brown and pale grey, bedded at 0°-10°, highly weathered, very low to low strength, fractured, Mittagong Formation			1.46 1.5		PL(A) = 0.4		
11.4	2	SANDSTONE: medium to coarse grained, red-brown and orange-brown with some pale grey, with ironstone bands, distinct and indistinct bedding at 0°-10°, highly weathered, high strength with very low strength bands, slightly fractured, Hawkesbury Sandstone		C	1.96		PL(A) = 1.9		
					2.29		PL(A) = 0.6		
					2.5				
10.9		Below 1.67m: orange-brown and pale grey, moderately weathered to slightly weathered			2.67		PL(A) = 0.5		
10.4	3	SANDSTONE: medium to coarse grained, pale grey, cross-bedded at 10°-20°, with 20% fine grained, grey to dark grey sandstone laminations, medium or high strength, slightly weathered, slightly fractured to unbroken, Hawkesbury Sandstone		C					
10.4	3.0								
9.4	4				3.95 4.0		PL(A) = 1.1		
		Below 4.36m: grading to fresh			4.42		PL(A) = 0.6		
				C					
8.9	5				4.95		PL(A) = 1.2		
		Below 5.2m: distinct and indistinct bedding at 0°-20°, with 5-10% carbonaceous laminations and flecks							
					5.5				
7.9	6				5.96		PL(A) = 0.7		
				C					
7.4	7				6.95 7.0		PL(A) = 1.7		
					7.19		PL(A) = 1.3		
				C					
6.4	8				7.95		PL(A) = 1.2		
					8.3		PL(A) = 1.1		
					8.5				
5.4	9				8.96		PL(A) = 1		
				C					
4.4					9.95		PL(A) = 1.6		Sand filter 1.3-18.0m Slotted PVC pipe

RIG: XC Drill **DRILLER:** Terratest **LOGGED:** IT **CASING:** HWT to 0.5m

TYPE OF BORING: Diatube (200mm dia.) to 0.24m, Solid Flight Auger (TC-bit) 0.24-0.53m, NMLC Coring 0.53-18.1m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: *Field replicate BD1/110311 collected from 0.35-0.5m; Groundwater well installed: blank PVC 0.0-1.5m, screen PVC 1.5-18.0m, bentonite 0.0-1.3m, gravel 1.3-18.0m, backfill 18.0-18.1m, gatic cover at the surface; 100% water loss from 16.0-18.1m

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 13.4 m AHD
EASTING: 333935
NORTHING: 6249290
DIP/AZIMUTH: 90°/--

BORE No: BH1002
PROJECT No: 86884.02
DATE: 11/3/2021
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
		SANDSTONE: medium to coarse grained, pale grey, cross-bedded at 10°-20°, with 20% fine grained, grey to dark grey sandstone laminations, medium or high strength, slightly weathered, slightly fractured to unbroken, Hawkesbury Sandstone *(continued)*			10.03				1.5-18.0m
				C	10.92		PL(A) = 1.3		
					11.55				
				C	11.95		PL(A) = 0.8		
					12.95		PL(A) = 0.8		
				C	13.0				
					13.95		PL(A) = 1.4		
				C	14.5				
					14.95		PL(A) = 2.6		
				C	15.95		PL(A) = 1.2		
					16.0				
				C	16.38		PL(A) = 1.3	19-03-21	
		Between 17.10-17.35m: siltstone clasts, up to 10mm			17.38		PL(A) = 0.8		
				C	17.43				
	18.1	Bore discontinued at 18.1m - Target depth reached			18.1				Backfill 18-18.1m End Cap

RIG: XC Drill **DRILLER:** Terratest **LOGGED:** IT **CASING:** HWT to 0.5m

TYPE OF BORING: Diatube (200mm dia.) to 0.24m, Solid Flight Auger (TC-bit) 0.24-0.53m, NMLC Coring 0.53-18.1m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: *Field replicate BD1/110311 collected from 0.35-0.5m; Groundwater well installed: blank PVC 0.0-1.5m, screen PVC 1.5-18.0m, bentonite 0.0-1.3m, gravel 1.3-18.0m, backfill 18.0-18.1m, gatic cover at the surface; 100% water loss from 16.0-18.1m

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 14.3 m AHD
EASTING: 333899
NORTHING: 6249275
DIP/AZIMUTH: 90°/--

BORE No: BH1003
PROJECT No: 86884.02
DATE: 10/3/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
14	0.04	STONE TILE							
	0.09	SAND and CEMENT							
	0.25	CONCRETE SLAB At 0.2m: 8mm steel reinforcement		A/E	0.25 0.3		PID<1ppm		
		FILL/Clayey SAND: fine to medium, brown, with medium to coarse sandstone gravel, boulders, concrete and brick rubble, trace ash and slag		A/E	0.7 0.8		PID<1ppm		
13	1.3	Bore discontinued at 1.3m - Refusal on bricks (3 courses deep, minimum 4 bricks long)							
12									
11									
10									

RIG: NDD and hand tools **DRILLER:** Excavac **LOGGED:** JS **CASING:** Uncased

TYPE OF BORING: Diatube (200mm dia.) to 0.25m, Non-Destructive Digging 0.25-1.3m

WATER OBSERVATIONS: No free ground water observed

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 14.3 m AHD
EASTING: 333900
NORTHING: 6249274
DIP/AZIMUTH: 90°/--

BORE No: BH1003A
PROJECT No: 86884.02
DATE: 10 - 19/3/2021
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
14	0.04	STONE TILE										
	0.12	SAND and CEMENT										
	0.23	CONCRETE SLAB At 0.2m: 8mm steel reinforcement							A/E*			PID<1
		FILL/Clayey SAND: fine to medium, brown, with sandstone gravel and cobbles, concrete and brick rubble and bricks, trace ash and slag							A/E			PID<1
13	1.2	SAND SP: medium, pale brown and pale grey, moist, medium dense, alluvial							A/E			PID<1
12	2								A/E*			PID<1
		Below 2.8m: dense				19-03-21			S			8,15,22 N = 37
11	3											
	4	4.0 Silty CLAY CI-CH: medium to high plasticity, pale grey and brown, with ironstone gravel, w<PL, apparently stiff to very stiff, residual soil						Unless otherwise stated, rock is fractured along rough, planar bedding dipping 0-5°, with iron staining or clay coating				
10	4.3	Clayey SAND SC: medium, brown, moist, apparently medium dense to dense, extremely weathered sandstone							S			5/0 refusal
	4.58	SANDSTONE: medium grained, brown, pale grey and red-brown, bedded at 0-10°, very low to low strength, highly weathered, fractured, Mittagong Formation						4.83-4.87m: Ds 40mm	C	100	73	PL(A) = 0.05
	4.87											
	5.0											

RIG: NDD, hand tools, XC Drill **DRILLER:** Excavac, Terratest **LOGGED:** JS **CASING:** HW to 2.0m, HQ to 5.0m

TYPE OF BORING: Diatube (200mm dia.) to 0.23m, Non-Destructive Digging 0.23-2.0m, Solid Flight Auger (TC-bit) 2.0-4.58m, NMLC Coring 4.58-14.41m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: *Field replicate BD2/100321 from 0.23-0.30m and field replicate BD3/100321 from 1.9-2.0m; Groundwater well installed: Blank PVC 0.0-1.7m, screen PVC 1.7-4.0m, bentonite 0.5-1.5m and 4.0-6.0m, sand 1.5-4m, backfill 0-0.5m and 6.0-14.41m, gatic cover

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 14.3 m AHD
EASTING: 333900
NORTHING: 6249274
DIP/AZIMUTH: 90°/--

BORE No: BH1003A
PROJECT No: 86884.02
DATE: 10 - 19/3/2021
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
9		SANDSTONE: medium to coarse grained, brown, pale grey and red-brown, cross-bedded at 0-20°, medium strength with extremely low and very low strength bands, highly weathered, slightly fractured, Hawkesbury Sandstone						5.03m: B20°, pl, ro, fe co	C	100	73	PL(A) = 0.6
	6							5.60-5.64m: Ds 40mm				
8									C	100	80	PL(A) = 0.5
								6.61m: B10° (x2), pl, ro, fe co				
								6.70-6.82m: Ds 120mm				
	7	Below 6.85m: pale grey, distinct and indistinct bedding at 0-10° with some cross-bedding, medium and medium to high strength, slightly weathered then fresh										PL(A) = 1
7								7.62-7.67m: Ds 50mm				
								7.68m: J50°, pl, ro, cly co				
	8							7.9m: B5°, pl, ro, cly co 10mm	C	100	95	PL(A) = 1
6												
	9											
5		Between 9.23-9.35m: grey, fine to medium grained band						9.28-9.31m: B10° (x3), pl, ro, cly co	C	100	82	PL(A) = 0.9

RIG: NDD, hand tools, XC Drill **DRILLER:** Excavac, Terratest **LOGGED:** JS **CASING:** HW to 2.0m, HQ to 5.0m

TYPE OF BORING: Diatube (200mm dia.) to 0.23m, Non-Destructive Digging 0.23-2.0m, Solid Flight Auger (TC-bit) 2.0-4.58m, NMLC Coring 4.58-14.41m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: *Field replicate BD2/100321 from 0.23-0.30m and field replicate BD3/100321 from 1.9-2.0m; Groundwater well installed: Blank PVC 0.0-1.7m, screen PVC 1.7-4.0m, bentonite 0.5-1.5m and 4.0-6.0m, sand 1.5-4m, backfill 0-0.5m and 6.0-14.41m, gatic cover

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 14.3 m AHD
EASTING: 333900
NORTHING: 6249274
DIP/AZIMUTH: 90°/--

BORE No: BH1003A
PROJECT No: 86884.02
DATE: 10 - 19/3/2021
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
		SANDSTONE: medium to coarse grained, brown, pale grey and red-brown, cross-bedded at 0-20°, medium strength with extremely low and very low strength bands, highly weathered, slightly fractured, Hawkesbury Sandstone *(continued)*							C	100	82	PL(A) = 0.7
	11	Between 10.93-11.14m: extremely weathered seam						10.93-11.14m: Ds 210mm	C	100	86	PL(A) = 0.8
	12							12.35-12.40m: J50°, ir, ro, cln 12.46-12.53m: J60°, ir, ro, cln, healed	C	100	91	PL(A) = 1
	13	Between 13.58-13.84m: grey, fine to medium grained bed, with 10% dark grey siltstone laminations						13.81-13.83m: Ds 20mm	C	100	92	PL(A) = 0.9
	14											
	14.41	Bore discontinued at 14.41m - Target depth reached										

RIG: NDD, hand tools, XC Drill **DRILLER:** Excavac, Terratest **LOGGED:** JS **CASING:** HW to 2.0m, HQ to 5.0m

TYPE OF BORING: Diatube (200mm dia.) to 0.23m, Non-Destructive Digging 0.23-2.0m, Solid Flight Auger (TC-bit) 2.0-4.58m, NMLC Coring 4.58-14.41m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: *Field replicate BD2/100321 from 0.23-0.30m and field replicate BD3/100321 from 1.9-2.0m; Groundwater well installed: Blank PVC 0.0-1.7m, screen PVC 1.7-4.0m, bentonite 0.5-1.5m and 4.0-6.0m, sand 1.5-4m, backfill 0-0.5m and 6.0-14.41m, gatic cover

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 14.3 m AHD
EASTING: 333900
NORTHING: 6249274
DIP/AZIMUTH: 90°/--

BORE No: BH1003A
PROJECT No: 86884.02
DATE: 10 - 19/3/2021
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
14.3	0.04	STONE TILE							
	0.12	SAND and CEMENT		A/E*	0.23		PID<1		Backfill 0-0.5m
	0.23	CONCRETE SLAB At 0.2m: 8mm steel reinforcement			0.3				
		FILL/Clayey SAND: fine to medium, brown, with sandstone gravel and cobbles, concrete and brick rubble and bricks, trace ash and slag		A/E	0.8 0.9		PID<1		Bentonite 0.5-1.5m
13	1.2	SAND SP: medium, pale brown and pale grey, moist, medium dense, alluvial		A/E	1.4 1.5		PID<1		
12	2			A/E*	1.9 2.0		PID<1		
				S	2.5 2.95		8,15,22 N = 37	19-03-21	Sand filter 1.5-4.0m Slotted PVC pipe 1.7-4.0m
11	3	Below 2.8m: dense							
10	4.0	Silty CLAY CI-CH: medium to high plasticity, pale grey and brown, with ironstone gravel, w<PL, apparently stiff to very stiff, residual soil							End Cap
	4.3			S	4.5 4.58		5/0 refusal		
	4.58	Clayey SAND SC: medium, brown, moist, apparently medium dense to dense, extremely weathered sandstone			4.6		PL(A) = 0.05		
9	4.87 5.0	SANDSTONE: medium grained, brown, pale grey and red-brown, bedded at 0-10°, very low to low strength, highly weathered, fractured, Mittagong Formation		C	5.51		PL(A) = 0.6		Bentonite fill 4.0-6m
		SANDSTONE: medium to coarse grained, brown, pale grey and red-brown, cross-bedded at 0-20°, medium strength with extremely low and very low strength bands, highly weathered, slightly fractured, Hawkesbury Sandstone			6.0				
8	6				6.34		PL(A) = 0.5		
				C					
7	7	Below 6.85m: pale grey, distinct and indistinct bedding at 0-10° with some cross-bedding, medium and medium to high strength, slightly weathered then fresh			7.48 7.53		PL(A) = 1		
6	8			C	8.95		PL(A) = 1		
	9				9.13				
5		Between 9.23-9.35m: grey, fine to medium grained band		C	9.86		PL(A) = 0.9		

RIG: NDD, hand tools, XC Drill **DRILLER:** Excavac, Terratest **LOGGED:** JS **CASING:** HW to 2.0m, HQ to 5.0m

TYPE OF BORING: Diatube (200mm dia.) to 0.23m, Non-Destructive Digging 0.23-2.0m, Solid Flight Auger (TC-bit) 2.0-4.58m, NMLC Coring 4.58-14.41m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: *Field replicate BD2/100321 from 0.23-0.30m and field replicate BD3/100321 from 1.9-2.0m; Groundwater well installed: Blank PVC 0.0-1.7m, screen PVC 1.7-4.0m, bentonite 0.5-1.5m and 4.0-6.0m, sand 1.5-4m, backfill 0-0.5m and 6.0-14.41m, gatic cover

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 14.3 m AHD
EASTING: 333900
NORTHING: 6249274
DIP/AZIMUTH: 90°/--

BORE No: BH1003A
PROJECT No: 86884.02
DATE: 10 - 19/3/2021
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
4	11	SANDSTONE: medium to coarse grained, brown, pale grey and red-brown, cross-bedded at 0-20°, medium strength with extremely low and very low strength bands, highly weathered, slightly fractured, Hawkesbury Sandstone *(continued)*		C	10.56 10.66		PL(A) = 0.7		Backfill 6-14.41m
3		Between 10.93-11.14m: extremely weathered seam		C	11.63		PL(A) = 0.8		
2	12				12.19				
1	13			C	12.93		PL(A) = 1		
		Between 13.58-13.84m: grey, fine to medium grained bed, with 10% dark grey siltstone laminations			13.61 13.72		PL(A) = 0.9		
0	14			C					
	14.41	Bore discontinued at 14.41m - Target depth reached			14.41				
-1	15								
-2	16								
-3	17								
-4	18								
-5	19								

RIG: NDD, hand tools, XC Drill **DRILLER:** Excavac, Terratest **LOGGED:** JS **CASING:** HW to 2.0m, HQ to 5.0m

TYPE OF BORING: Diatube (200mm dia.) to 0.23m, Non-Destructive Digging 0.23-2.0m, Solid Flight Auger (TC-bit) 2.0-4.58m, NMLC Coring 4.58- 14.41m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: *Field replicate BD2/100321 from 0.23-0.30m and field replicate BD3/100321 from 1.9-2.0m; Groundwater well installed: Blank PVC 0.0-1.7m, screen PVC 1.7-4.0m, bentonite 0.5-1.5m and 4.0-6.0m, sand 1.5-4m, backfill 0-0.5m and 6.0-14.41m, gatic cover

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 15.8 m AHD
EASTING: 333920
NORTHING: 6249261
DIP/AZIMUTH: 90°/--

BORE No: BH1004
PROJECT No: 86884.02
DATE: 10/3/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
15	0.04	STONE TILE							
	0.11	SAND and CEMENT							
	0.3	CONCRETE SLAB							
		FILL/Sandy CLAY: low to medium plasticity, brown and grey, with fine to medium sandstone and ironstone gravel, brick rubble, sandstone boulders, and igneous rock cobbles (railway ballast), trace ash and slag		A/E*	0.3 0.4		PID<1ppm		
				A/E	0.6 0.7		PID<1ppm		
	0.8	FILL: building rubble (concrete rubble, bricks, railway ballast and sandstone boulders in a clayey sand matrix)							
14	1.1	Bore discontinued at 1.1m - Refusal in fill							
13									
12									
11									

RIG: NDD and hand tools **DRILLER:** Excavac **LOGGED:** JS **CASING:** Uncased

TYPE OF BORING: Diatube (200mm dia.) to 0.30m, Non-Destructive Digging 0.30-1.1m

WATER OBSERVATIONS: No free ground water observed

REMARKS: *Field replicate BD2/10.03.21 collected from 0.3-0.4m.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 15.8 m AHD
EASTING: 333921
NORTHING: 6249260
DIP/AZIMUTH: 90°/--

BORE No: BH1004A
PROJECT No: 86884.02
DATE: 11 - 18/3/2021
SHEET 1 OF 4

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
	0.04	STONE TILE										
	0.1	SAND and CEMENT										
		CONCRETE SLAB										
	0.3	At 0.26m: 8mm reinforcement steel							A/E*			PID<1ppm
15		FILL/Clayey SAND: fine to medium, brown, with silty clay, sandstone gravel and cobbles, igneous rock cobbles (railway ballast), concrete and brick rubble, bricks and rubbish (plastic bottles), trace ash and slag										
	0.6											
	1	FILL: building rubble (concrete rubble, bricks, railway ballast, sandstone gravel, cobbles and boulders, in a clayey sand matrix)							A/E			PID<1ppm
14	2											
	2.1	FILL/SILT: low to non-plastic, grey, with sandstone gravel and bricks							A/E			PID<1ppm
	2.2	FILL: building rubble (concrete and bricks - possible footing)										
13	2.7	FILL/SAND: medium, brown, moist										
	3 3.0	SAND SP: medium, pale grey, wet, medium dense to dense, alluvial							S/E			7,12,18 N = 30 PID<1ppm REC = 0.3m
12	4 4.0	Silty CLAY CL-CI: low to medium plasticity, grey, trace charcoal, w>PL, very soft to soft, alluvial							S			pp = 50 2,0,0 N = 0 REC = 0.2m
11												

RIG: NDD, hand tools, XC Drill **DRILLER:** Excavac, Terratest **LOGGED:** JS **CASING:** HW to 2.6m

TYPE OF BORING: Diatube (200mm dia.) and Non-Destructive Digging (NDD) to 2.1m, NDD 2.1-2.3m, NMLC coring 2.3-3.1m, washbore 3.1-6.0m, NMLC coring 6.0-18.22m

WATER OBSERVATIONS: No free ground water observed

REMARKS: *Field replicate BD4/110321 collected from 0.3-0.4m.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 15.8 m AHD
EASTING: 333921
NORTHING: 6249260
DIP/AZIMUTH: 90°/--

BORE No: BH1004A
PROJECT No: 86884.02
DATE: 11 - 18/3/2021
SHEET 2 OF 4

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
10		Silty CLAY CL-CI: low to medium plasticity, grey, trace charcoal, w>PL, very soft to soft, alluvial *(continued)*						Unless otherwise stated, rock is fractured along rough, planar bedding dipping 0-5°, with ironstaining or clay coating				
	5.6	SANDSTONE: brown, low to medium strength, Mittagong Formation										
6	6.0	SANDSTONE: medium to coarse grained, brown, pale grey and red-brown, medium strength, highly weathered with 20-40% extremely weathered beds, slightly fractured, Mittagong Formation						6.33-6.83m: Ds 500mm	(S)			10/10 refusal PL(A) = 0.4
9	6.83	SANDSTONE: medium to coarse grained, red-brown, orange and pale grey, medium strength, highly then moderately weathered, slightly fractured, Hawkesbury Sandstone						7.41m: J30°, pl, ro, cly vn 7.50-7.54m: Ds 40mm 7.80-7.83m: Ds 30mm	C	100	60	PL(A) = 0.8
8		Below 7.86m: grading to pale grey, slightly weathered										PL(A) = 0.6
	8.36	SANDSTONE: fine to medium grained, pale grey, indistinct bedding at 0-10°, high strength, fresh, slightly fractured, Hawkesbury Sandstone						8.33-8.36m: Ds 30mm	C	100	93	PL(A) = 1.2
7	8.93	SANDSTONE: medium to coarse grained, pale grey, distinct and indistinct bedding at 0-10°, cross-bedded, medium strength, fresh, slightly fractured to unbroken, Hawkesbury Sandstone						8.93m: B10°, pl, ro, cly co 10mm	C	100	100	PL(A) = 0.8

RIG: NDD, hand tools, XC Drill **DRILLER:** Excavac, Terratest **LOGGED:** JS **CASING:** HW to 2.6m

TYPE OF BORING: Diatube (200mm dia.) and Non-Destructive Digging (NDD) to 2.1m, NDD 2.1-2.3m, NMLC coring 2.3-3.1m, washbore 3.1-6.0m, NMLC coring 6.0-18.22m

WATER OBSERVATIONS: No free ground water observed

REMARKS: *Field replicate BD4/110321 collected from 0.3-0.4m.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 15.8 m AHD
EASTING: 333921
NORTHING: 6249260
DIP/AZIMUTH: 90°/--

BORE No: BH1004A
PROJECT No: 86884.02
DATE: 11 - 18/3/2021
SHEET 3 OF 4

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
		SANDSTONE: medium to coarse grained, pale grey, distinct and indistinct bedding at 0-10°, cross-bedded, medium strength, fresh, slightly fractured to unbroken, Hawkesbury Sandstone *(continued)*							C	100	100	
	11								C	100	95	PL(A) = 0.7
	12								C	100	100	PL(A) = 0.9
	13											PL(A) = 0.9
	14							13.82m: B5°, pl, ro, cly co 5mm 14.31m: B10°, pl, ro, cly vn 14.91m: B10°, pl, ro, cly vn	C	100	99	PL(A) = 0.8 PL(A) = 0.8

RIG: NDD, hand tools, XC Drill **DRILLER:** Excavac, Terratest **LOGGED:** JS **CASING:** HW to 2.6m

TYPE OF BORING: Diatube (200mm dia.) and Non-Destructive Digging (NDD) to 2.1m, NDD 2.1-2.3m, NMLC coring 2.3-3.1m, washbore 3.1-6.0m, NMLC coring 6.0-18.22m

WATER OBSERVATIONS: No free ground water observed

REMARKS: *Field replicate BD4/110321 collected from 0.3-0.4m.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 15.8 m AHD
EASTING: 333921
NORTHING: 6249260
DIP/AZIMUTH: 90°/--

BORE No: BH1004A
PROJECT No: 86884.02
DATE: 11 - 18/3/2021
SHEET 4 OF 4

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
0	16	SANDSTONE: medium to coarse grained, pale grey, distinct and indistinct bedding at 0-10°, cross-bedded, medium strength, fresh, slightly fractured to unbroken, Hawkesbury Sandstone *(continued)* Between 15.15-15.47m: extremely low strength, extremely weathered bed						15.15-15.47m: Ds 320mm 15.52-15.59m: J70°, pl, ro, cly vn, partially healed 15.83m: B10°, pl, ro, cly co 10mm 15.83-16.00m: J80°, ir, ro, cln, partially healed 15.96m: B10°, pl, ro, cly co 10mm	C	100	99	
									C	100	65	PL(A) = 0.9
-1	17	Between 16.72-17.42m: cross-bedded at 0-10°, low strength, with extremely weathered seams, fractured						16.6m: B10°, pl, ro, cly co 5mm 16.72m: B10°, pl, ro, cly co 5mm 16.85m: B10°, pl, ro, cly co 5mm 16.95m: B10°, pl, ro, cly co 10mm 17.18m: B10°, pl, ro, cly co 5mm 17.29-17.42m: Ds 130mm				PL(A) = 0.3
		Between 17.42-18.22m: cross-bedded at 0-10°, high strength, slightly fractured							C	100	86	
-2	18							17.7m: B10°, pl, ro, cly co 10mm 17.81m: B5°, ir, ro, cbs				PL(A) = 1.7
	18.22	Bore discontinued at 18.22m - Target depth reached										
-3	19											
-4												

RIG: NDD, hand tools, XC Drill **DRILLER:** Excavac, Terratest **LOGGED:** JS **CASING:** HW to 2.6m

TYPE OF BORING: Diatube (200mm dia.) and Non-Destructive Digging (NDD) to 2.1m, NDD 2.1-2.3m, NMLC coring 2.3-3.1m, washbore 3.1-6.0m, NMLC coring 6.0-18.22m

WATER OBSERVATIONS: No free ground water observed

REMARKS: *Field replicate BD4/110321 collected from 0.3-0.4m.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 15.9 m AHD
EASTING: 333920
NORTHING: 6249246
DIP/AZIMUTH: 90°/--

BORE No: BH1005
PROJECT No: 86884.02
DATE: 10 - 16/3/2021
SHEET 1 OF 4

RL	Depth (m)	Description of Strata	Type	Core Rec. %	RQD %	Test Results & Comments
15	0.02	STONE TILE				
	0.07	SAND and CEMENT				
	0.22	CONCRETE SLAB: 3x plastic conduit (empty)	A/E*			PID<1ppm
	0.3	Between 0.17-0.20m: 8mm steel reinforcement				
		FILL/Clayey SAND: fine to medium, brown, with fine to medium gravel and concrete rubble, dry	A/E			PID<1ppm
	1	FILL: building rubble (concrete rubble, bricks, sandstone gravel, cobbles and boulders, railway ballast, ash, slag, in sandy clay matrix)				
	1.3	FILL/Clayey SAND: fine to medium, brown and grey, with sandstone and igneous rock gravel and cobbles and brick rubble, trace ash and slag	A/E			PID<1ppm
14	2					
	2.8	SAND SP: medium, pale grey, wet, medium dense to dense, alluvial	S/E			8,15,15 N = 30 PID<1ppm
13	3		A/E			
12	4					
	4.2	SAND SP: medium, pale brown and red-brown, wet, dense to very dense, alluvial	S			10,25 refusal
11	5.0					

Degree of Weathering: EW, HW, MW, SW, FS, FR
Graphic Log
Rock Strength: Ex Low, Very Low, Low, Medium, High, Very High, Ex High
Water
Fracture Spacing (m): 0.01, 0.05, 0.10, 0.50, 1.00
Discontinuities: B - Bedding, J - Joint, S - Shear, F - Fault

RIG: NDD, hand tools, XC Drill **DRILLER:** Excavac, Terratest **LOGGED:** JS **CASING:** HW to 2.3m

TYPE OF BORING: Diatube (200mm dia.) to 0.22m, Non-Destructive Digging 0.22-1.65m, Solid Flight Auger (TC-bit) 1.65-8.74m, NMLC coring 8.74-15.85m

WATER OBSERVATIONS: Groundwater not observed in open hole prior to auger drilling, due to surface water filling hole

REMARKS: *Field replicate BD1/100321 collected from 0.22-0.30m. Sand collapse at 2.5m, possible water table level

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 15.9 m AHD
EASTING: 333920
NORTHING: 6249246
DIP/AZIMUTH: 90°/--

BORE No: BH1005
PROJECT No: 86884.02
DATE: 10 - 16/3/2021
SHEET 2 OF 4

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
		SAND SP: refer previous page										
	5.2	Silty CLAY CI-CH: medium to high plasticity, grey, trace fine gravel and charcoal, w=PL, stiff to very stiff, alluvial							S			pp = 400 4,7,12 N = 19
	6.2	Silty CLAY CI-CH: medium to high plasticity, pale grey and pale brown, with fine to medium ironstone gravel, w>=PL, stiff with some soft to firm layers, residual soil							S			pp = 200 5,6,6 N = 12
	8.0	Clayey SAND SC: medium, brown, dry, very dense, extremely weathered sandstone						Unless otherwise stated, rock is fractured along rough, planar bedding dipping 0-5°, with ironstaining or clay infill	S			15/100 refusal
	8.74	SANDSTONE: medium grained, orange-brown, very low strength, highly weathered, fractured, Hawkesbury Sandstone										
	8.9	SANDSTONE: medium to coarse grained, pale grey, bedded at 0-10°, medium to high strength, slightly weathered, slightly fractured to unbroken, Hawkesbury Sandstone							C	100	87	PL(A) = 0.9
									C	100	92	PL(A) = 0.9

RIG: NDD, hand tools, XC Drill **DRILLER:** Excavac, Terratest **LOGGED:** JS **CASING:** HW to 2.3m

TYPE OF BORING: Diatube (200mm dia.) to 0.22m, Non-Destructive Digging 0.22-1.65m, Solid Flight Auger (TC-bit) 1.65-8.74m, NMLC coring 8.74- 15.85m

WATER OBSERVATIONS: Groundwater not observed in open hole prior to auger drilling, due to surface water filling hole

REMARKS: *Field replicate BD1/100321 collected from 0.22-0.30m. Sand collapse at 2.5m, possible water table level

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 15.9 m AHD
EASTING: 333920
NORTHING: 6249246
DIP/AZIMUTH: 90°/--

BORE No: BH1005
PROJECT No: 86884.02
DATE: 10 - 16/3/2021
SHEET 3 OF 4

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
5	11	SANDSTONE: medium to coarse grained, pale grey, bedded at 0-10°, medium to high strength, slightly weathered, slightly fractured to unbroken, Hawkesbury Sandstone *(continued)* Between 10.13-13.05m: fresh						10.11-10.13m: Ds 20mm	C	100	92	PL(A) = 0.9
4	12	Between 12.33-12.51m: fine to medium grained, grey							C	100	100	PL(A) = 0.9 PL(A) = 1.1
3	13 13.05	SANDSTONE: medium to coarse grained, pale grey, indistinct bedding at 0-10°, very low then low strength, highly weathered with extremely weathered seams, fractured, Hawkesbury Sandstone						13.05m: B 10°, pl, ro, cly co 13.31-13.33m: Ds 20mm 13.50-13.55m: Ds 50mm 13.60-13.6m: J40° (x2), pl, ro, cly co 10mm 13.84-13.86m: Ds 20mm	C	100	31	PL(A) = 0.1
2	14 14.21	SANDSTONE: medium to coarse grained, pale grey, bedded at 0-10°, low to medium strength, slightly weathered, slightly fractured, Hawkesbury Sandstone Below 14.75m: medium or medium to high strength, fresh						14.04m: B10°, pl, ro, cly co 10mm 14.1m: J60°, ir, ro, cly co 14.17m: J40°, ir, ro, cly co 14.21m: B10°, pl, ro, cly vn 14.62-14.66m: Ds 20mm 14.72-14.75m: Ds 30mm	C	100	84	PL(A) = 0.3 PL(A) = 0.8
1												

RIG: NDD, hand tools, XC Drill **DRILLER:** Excavac, Terratest **LOGGED:** JS **CASING:** HW to 2.3m

TYPE OF BORING: Diatube (200mm dia.) to 0.22m, Non-Destructive Digging 0.22-1.65m, Solid Flight Auger (TC-bit) 1.65-8.74m, NMLC coring 8.74- 15.85m

WATER OBSERVATIONS: Groundwater not observed in open hole prior to auger drilling, due to surface water filling hole

REMARKS: *Field replicate BD1/100321 collected from 0.22-0.30m. Sand collapse at 2.5m, possible water table level

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 15.9 m AHD
EASTING: 333920
NORTHING: 6249246
DIP/AZIMUTH: 90°/--

BORE No: BH1005
PROJECT No: 86884.02
DATE: 10 - 16/3/2021
SHEET 4 OF 4

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
		SANDSTONE: medium to coarse grained, pale grey, bedded at 0-10°, low to medium strength, slightly weathered, slightly fractured, Hawkesbury Sandstone *(continued)*							C	100	84	PL(A) = 1
	15.85	Bore discontinued at 15.85m - Target depth reached										

RIG: NDD, hand tools, XC Drill **DRILLER:** Excavac, Terratest **LOGGED:** JS **CASING:** HW to 2.3m

TYPE OF BORING: Diatube (200mm dia.) to 0.22m, Non-Destructive Digging 0.22-1.65m, Solid Flight Auger (TC-bit) 1.65-8.74m, NMLC coring 8.74-15.85m

WATER OBSERVATIONS: Groundwater not observed in open hole prior to auger drilling, due to surface water filling hole

REMARKS: *Field replicate BD1/100321 collected from 0.22-0.30m. Sand collapse at 2.5m, possible water table level

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 15.7 m AHD
EASTING: 333896
NORTHING: 6249252
DIP/AZIMUTH: 90°/--

BORE No: BH1006
PROJECT No: 86884.02
DATE: 10/3/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
15	0.02	STONE TILE							
	0.06	SAND and CEMENT							
	0.18	CONCRETE SLAB							
		At 0.18m: 20mm copper water pipe							
		FILL: igneous rock cobbles (railway ballast) with fine to medium grained sand and brick rubble							
		At 0.4m: 8mm steel reinforcement fragment							
	0.8	0.80-0.85m: 65mm and 100mm copper pipes (buried services)							
	1	Bore discontinued at 0.8m - Refusal on buried services							
14	2								
13	3								
12	4								
11									

RIG: NDD and hand tools **DRILLER:** Excavac **LOGGED:** JS **CASING:** Uncased

TYPE OF BORING: Diatube (200mm dia.) to 0.18m, Non-Destructive Digging 0.18-0.80m

WATER OBSERVATIONS: No free ground water observed

REMARKS: Terminated on copper pipes

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 15.8 m AHD
EASTING: 333896
NORTHING: 6249263
DIP/AZIMUTH: 90°/--

BORE No: BH1007
PROJECT No: 86884.02
DATE: 11 - 17/3/2021
SHEET 1 OF 4

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
	0.02	STONE TILE										
	0.07	SAND and CEMENT										
	0.2	CONCRETE SLAB Between 0.14-0.15m: 8mm steel reinforcement							A/E*			PID<1ppm
15		FILL/Clayey SAND: fine to medium, brown and grey, with sandstone gravel and cobbles, igneous rock cobble (railway ballast), concrete rubble and bricks, trace ash and slag							A/E			PID<1ppm
	1											
									A/E			PID<1ppm
14												
	2								A/E			PID<1ppm
	2.3	FILL/SAND: medium to coarse, pale brown and grey, with pale grey and red-brown silty clay and fine to medium gravel, moist										
13									S/E			4,6,6 N = 12 PID60 ppm
	3											
	3.5	SAND SP: medium, pale grey, wet, dense, alluvial										
12						▼ 16-03-21			S/E*			8,16,25 N = 41 PID16 ppm
	4											
11												

RIG: NDD, hand tools, XC Drill **DRILLER:** Excavac, Terratest **LOGGED:** JS **CASING:** HW to 1.7m, HQ to 9.2m

TYPE OF BORING: Diatube (200mm dia.) to 0.2m, Non-Destructive Digging 0.2-1.6m, Solid Flight Auger (TC-bit) 1.6-8.5m, washbore 8.5-9.5m, NMLC coring 9.5-16.2m

WATER OBSERVATIONS: Free groundwater observed at 4.2m depth whilst augering

REMARKS: *Field replicates BD1/110321 from 0.2-0.3m and BD1/160321 from 4.0-4.45m; 20% water loss below 12.8 and 80% loss below 14.64m; Standpipe installed:- Blank PVC 0.0-10.2m, screen PVC 10.2-16.2m, bentonite 8.5-9.5m, sand 9.5-16.2m, backfill 0-0.5m, gatic

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 15.8 m AHD
EASTING: 333896
NORTHING: 6249263
DIP/AZIMUTH: 90°/--

BORE No: BH1007
PROJECT No: 86884.02
DATE: 11 - 17/3/2021
SHEET 2 OF 4

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
		SAND SP: medium, pale grey, wet, dense, alluvial *(continued)* Below 5.0m: grading to loose										
	5.7	Silty CLAY CL-CI: low to medium plasticity, grey, trace fine gravel, w>PL, stiff to very stiff, alluvial							S			pp = 100 3,7,9 N = 16
	6.5	SAND SP: medium, brown, wet, medium dense, alluvial										
	7.2	Silty CLAY CI-CH: medium to high plasticity, pale grey and brown, with ironstone gravel, w>PL, very stiff, residual soil							S			pp = 500 8,15,15 N = 30
	8.0	Clayey SAND SC: medium to coarse, pale grey and brown, with silty clay layers, wet, medium dense, extremely weathered sandstone						Unless otherwise stated, rock is fractured along rough, planar bedding dipping 0-5°, with iron staining or clay coating	S			20,13,8 N = 21
	9.2	SANDSTONE: brown, very low strength, Hawkesbury Sandstone				19-03-21						
	9.5	SANDSTONE: medium to coarse grained, brown, indistinct bedding at 0-10°, very low strength, highly weathered, fractured, Hawkesbury Sandstone							C	100	97	PL(A) = 0.1
	9.83	SANDSTONE: refer following page										PL(A) = 1.2
	10.0											

RIG: NDD, hand tools, XC Drill **DRILLER:** Excavac, Terratest **LOGGED:** JS **CASING:** HW to 1.7m, HQ to 9.2m

TYPE OF BORING: Diatube (200mm dia.) to 0.2m, Non-Destructive Digging 0.2-1.6m, Solid Flight Auger (TC-bit) 1.6-8.5m, washbore 8.5-9.5m, NMLC coring 9.5-16.2m

WATER OBSERVATIONS: Free groundwater observed at 4.2m depth whilst augering

REMARKS: *Field replicates BD1/110321 from 0.2-0.3m and BD1/160321 from 4.0-4.45m; 20% water loss below 12.8 and 80% loss below 14.64m; Standpipe installed:- Blank PVC 0.0-10.2m, screen PVC 10.2-16.2m, bentonite 8.5-9.5m, sand 9.5-16.2m, backfill 0-0.5m, gatic

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 15.8 m AHD
EASTING: 333896
NORTHING: 6249263
DIP/AZIMUTH: 90°/--

BORE No: BH1007
PROJECT No: 86884.02
DATE: 11 - 17/3/2021
SHEET 3 OF 4

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
		SANDSTONE: medium to coarse grained, pale grey, distinct bedding at 0-10°, high strength, fresh, slightly fractured, Hawkesbury Sandstone *(continued)*							C	100	97	
	11	Below 10.87m: with 5-10% fine to medium grained beds, and low to medium strength to 10.91m Below 10.98m: medium strength to high strength, unbroken						10.87-10.91m: Ds 40mm 10.98m: B10°, pl, ro, cly co 10mm				PL(A) = 0.3
									C	100	88	PL(A) = 0.4
	12											
	13								C	100	100	PL(A) = 1.1
	14								C	100	97	PL(A) = 0.9
								14.64-14.68m: B5° (x5), pl, ro, cly co				PL(A) = 1.5

RIG: NDD, hand tools, XC Drill **DRILLER:** Excavac, Terratest **LOGGED:** JS **CASING:** HW to 1.7m, HQ to 9.2m

TYPE OF BORING: Diatube (200mm dia.) to 0.2m, Non-Destructive Digging 0.2-1.6m, Solid Flight Auger (TC-bit) 1.6-8.5m, washbore 8.5-9.5m, NMLC coring 9.5-16.2m

WATER OBSERVATIONS: Free groundwater observed at 4.2m depth whilst augering

REMARKS: *Field replicates BD1/110321 from 0.2-0.3m and BD1/160321 from 4.0-4.45m; 20% water loss below 12.8 and 80% loss below 14.64m; Standpipe installed:- Blank PVC 0.0-10.2m, screen PVC 10.2-16.2m, bentonite 8.5-9.5m, sand 9.5-16.2m, backfill 0-0.5m, gatic

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 15.8 m AHD
EASTING: 333896
NORTHING: 6249263
DIP/AZIMUTH: 90°/--

BORE No: BH1007
PROJECT No: 86884.02
DATE: 11 - 17/3/2021
SHEET 4 OF 4

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
0	16	SANDSTONE: medium to coarse grained, pale grey, distinct bedding at 0-10°, high strength, fresh, slightly fractured, Hawkesbury Sandstone *(continued)*							C	100	97	PL(A) = 0.8
									C	100	97	PL(A) = 1.3
	16.2	Bore discontinued at 16.2m - Target depth reached										
-1	17											
-2	18											
-3	19											
-4												

RIG: NDD, hand tools, XC Drill **DRILLER:** Excavac, Terratest **LOGGED:** JS **CASING:** HW to 1.7m, HQ to 9.2m

TYPE OF BORING: Diatube (200mm dia.) to 0.2m, Non-Destructive Digging 0.2-1.6m, Solid Flight Auger (TC-bit) 1.6-8.5m, washbore 8.5-9.5m, NMLC coring 9.5-16.2m

WATER OBSERVATIONS: Free groundwater observed at 4.2m depth whilst augering

REMARKS: *Field replicates BD1/110321 from 0.2-0.3m and BD1/160321 from 4.0-4.45m; 20% water loss below 12.8 and 80% loss below 14.64m; Standpipe installed:- Blank PVC 0.0-10.2m, screen PVC 10.2-16.2m, bentonite 8.5-9.5m, sand 9.5-16.2m, backfill 0-0.5m, gatic

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 15.8 m AHD
EASTING: 333896
NORTHING: 6249263
DIP/AZIMUTH: 90°/--

BORE No: BH1007
PROJECT No: 86884.02
DATE: 11 - 17/3/2021
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
15	0.02	STONE TILE							
	0.07	SAND and CEMENT		A/E*	0.2 0.3		PID<1ppm		
	0.2	CONCRETE SLAB Between 0.14-0.15m: 8mm steel reinforcement		A/E	0.6 0.7		PID<1ppm		
14	1	FILL/Clayey SAND: fine to medium, brown and grey, with sandstone gravel and cobbles, igneous rock cobble (railway ballast), concrete rubble and bricks, trace ash and slag		A/E	1.5 1.6		PID<1ppm		
	2			A/E	2.0 2.1		PID<1ppm		
13	2.3	FILL/SAND: medium to coarse, pale brown and grey, with pale grey and red-brown silty clay and fine to medium gravel, moist		S/E	2.5 2.95		4,6,6 N = 12 PID60 ppm		
	3								
12	3.5	SAND SP: medium, pale grey, wet, dense, alluvial		S/E*	4.0 4.45		8,16,25 N = 41 PID16 ppm	16-03-21	Backfill 0-0.5m
	4								
11	5	Below 5.0m: grading to loose							
	5.7	Silty CLAY CL-CI: low to medium plasticity, grey, trace fine gravel, w>PL, stiff to very stiff, alluvial		S	5.5 5.95		pp = 100 3,7,9 N = 16		
10	6								
	6.5	SAND SP: medium, brown, wet, medium dense, alluvial							
9	7			S	7.0 7.45		pp = 500 8,15,15 N = 30		
	7.2	Silty CLAY CI-CH: medium to high plasticity, pale grey and brown, with ironstone gravel, w>PL, very stiff, residual soil							
8	8								
	8.0	Clayey SAND SC: medium to coarse, pale grey and brown, with silty clay layers, wet, medium dense, extremely weathered sandstone		S	8.5 8.95		20,13,8 N = 21		
7	9								Bentonite 8.5-9.5m
	9.2	SANDSTONE: brown, very low strength, Hawkesbury Sandstone						19-03-21	
	9.5	SANDSTONE: medium to coarse grained, brown, indistinct bedding at 0-10°, very low strength, highly weathered, fractured, Hawkesbury Sandstone		C	9.5 9.52		PL(A) = 0.1		
6	9.83 10.0								

RIG: NDD, hand tools, XC Drill **DRILLER:** Excavac, Terratest **LOGGED:** JS **CASING:** HW to 1.7m, HQ to 9.2m

TYPE OF BORING: Diatube (200mm dia.) to 0.2m, Non-Destructive Digging 0.2-1.6m, Solid Flight Auger (TC-bit) 1.6-8.5m, washbore 8.5-9.5m, NMLC coring 9.5-16.2m

WATER OBSERVATIONS: Free groundwater observed at 4.2m depth whilst augering

REMARKS: *Field replicates BD1/110321 from 0.2-0.3m and BD1/160321 from 4.0-4.45m; 20% water loss below 12.8 and 80% loss below 14.64m; Standpipe installed:- Blank PVC 0.0-10.2m, screen PVC 10.2-16.2m, bentonite 8.5-9.5m, sand 9.5-16.2m, backfill 0-0.5m, gatic

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 15.8 m AHD
EASTING: 333896
NORTHING: 6249263
DIP/AZIMUTH: 90°/--

BORE No: BH1007
PROJECT No: 86884.02
DATE: 11 - 17/3/2021
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
		SANDSTONE: refer following page			9.96		PL(A) = 1.2		
		SANDSTONE: medium to coarse grained, pale grey, distinct bedding at 0-10°, high strength, fresh, slightly fractured, Hawkesbury Sandstone *(continued)*		C	10.7				
	11	Below 10.87m: with 5-10% fine to medium grained beds, and low to medium strength to 10.91m			10.94		PL(A) = 0.3		11
		Below 10.98m: medium strength to high strength, unbroken		C	11.44		PL(A) = 0.4		
	12				12.28				12
	13			C	12.96		PL(A) = 1.1		13 Sand filter 9.5-16.2m; Slotted PVC pipe 10.2-16.2m
					13.71				
	14				13.94		PL(A) = 0.9		14
				C					
	15				14.95		PL(A) = 1.5		15
					15.27		PL(A) = 0.8		
					15.3				
				C					
	16				15.96		PL(A) = 1.3		16
	16.2	Bore discontinued at 16.2m - Target depth reached			16.2				End Cap
	17								17
	18								18
	19								19

RIG: NDD, hand tools, XC Drill **DRILLER:** Excavac, Terratest **LOGGED:** JS **CASING:** HW to 1.7m, HQ to 9.2m

TYPE OF BORING: Diatube (200mm dia.) to 0.2m, Non-Destructive Digging 0.2-1.6m, Solid Flight Auger (TC-bit) 1.6-8.5m, washbore 8.5-9.5m, NMLC coring 9.5-16.2m

WATER OBSERVATIONS: Free groundwater observed at 4.2m depth whilst augering

REMARKS: *Field replicates BD1/110321 from 0.2-0.3m and BD1/160321 from 4.0-4.45m; 20% water loss below 12.8 and 80% loss below 14.64m; Standpipe installed:- Blank PVC 0.0-10.2m, screen PVC 10.2-16.2m, bentonite 8.5-9.5m, sand 9.5-16.2m, backfill 0-0.5m, gatic

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 14.0 AHD
EASTING: 333924.5
NORTHING: 6249271
DIP/AZIMUTH: 90°/--

BORE No: BH2001A
PROJECT No: 86884.02
DATE: 21 - 22/6/2021
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (XW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
14	0.15	CONCRETE SLAB: no steel reinforcement observed										
		FILL/SAND: medium, brown, with sandstone gravel, cobbles and boulders, trace concrete rubble, moist, generally in a very dense condition							A/E			PID<1
13	1.0	FILL/SAND: medium, brown and grey, with silty clay and sandstone, siltstone and igneous gravel, wet, generally in a medium dense condition				21-06-21		Unless otherwise stated, rock is fractured along rough, planar bedding dipping 0-10°, with ironstaining or clay coating	A/E			PID<1
12	2.0	Sandy CLAY CL-CI: low to medium plasticity, pale grey and brown, fine sand, w>PL, inferred very stiff to hard, residual soil							A/E			PID<1
	2.5	SANDSTONE: medium grained, brown and red-brown with pale grey bands, medium strength, highly weathered, slightly fractured, Mittagong Formation							C	100	0	PL(A) = 0.6
11	3							3.40m: Ds, 90mm	C	100	79	
	3.78	SANDSTONE: medium to coarse grained, red-brown and grey, cross-bedded and medium bedded, medium strength, moderately weathered, fractured, Hawkesbury Sandstone						3.60-3.70m: J80-90°, ir, ro, cly vn, he 3.75m: Ds, 30mm				PL(A) = 0.6
10	4											
	4.68							4.58-4.60m: B0-5°(x3), pl, ro, fe co	C	100	97	PL(A) = 0.7

RIG: Proline **DRILLER:** Tightsite **LOGGED:** JS **CASING:** HQ to 2.5 m
TYPE OF BORING: Diatube (150mm dia) to 0.15m, hand auger to 1.8m, rotary washbore to 2.5m, NMLC coring to 12m

WATER OBSERVATIONS: Free groundwater observed at 1.2m

REMARKS: Co-ordinates interpolated relative to site features. Surface level taken from Synman Justin Blalek Architects Pty Ltd, Job 4000, Drawing No. WD05, Rev D, dated 29 July 1989. Borehole re-instated using cement grout.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 14.0 AHD
EASTING: 333924.5
NORTHING: 6249271
DIP/AZIMUTH: 90°/--

BORE No: BH2001A
PROJECT No: 86884.02
DATE: 21 - 22/6/2021
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (XW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
9		SANDSTONE: medium to coarse grained, pale grey, distinctly and indistinctly bedded at 0-10°, with fine to medium grained bands, medium strength, fresh, slightly fractured, Hawkesbury Sandstone *(continued)*							C	100	97	
								5.67m: Ds, 20mm				
8	6											PL(A) = 0.7
		Below 6.4m: high strength, unbroken							C	100	100	
7	7											PL(A) = 1.4
		Below 7.33m: 1-5% carbonaceous laminations Below 7.6m: thinly to thickly bedded, medium to high strength										
6	8								C	100	100	PL(A) = 1.1
5	9											PL(A) = 0.8
									C	100	100	
												PL(A) = 1.2

RIG: Proline **DRILLER:** Tightsite **LOGGED:** JS **CASING:** HQ to 2.5 m
TYPE OF BORING: Diatube (150mm dia) to 0.15m, hand auger to 1.8m, rotary washbore to 2.5m, NMLC coring to 12m

WATER OBSERVATIONS: Free groundwater observed at 1.2m

REMARKS: Co-ordinates interpolated relative to site features. Surface level taken from Synman Justin Blalek Architects Pty Ltd, Job 4000, Drawing No. WD05, Rev D, dated 29 July 1989. Borehole re-instated using cement grout.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 14.0 AHD
EASTING: 333924.5
NORTHING: 6249271
DIP/AZIMUTH: 90°/--

BORE No: BH2001A
PROJECT No: 86884.02
DATE: 21 - 22/6/2021
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (XW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
4		SANDSTONE: medium to coarse grained, pale grey, distinctly and indistinctly bedded at 0-10°, with fine to medium grained bands, medium strength, fresh, slightly fractured, Hawkesbury Sandstone *(continued)*										
3	11								C	100	100	PL(A) = 1
												PL(A) = 0.9
2	12 12.0	Bore discontinued at 12.0m - Target depth										
1	13											
0	14											

RIG: Proline **DRILLER:** Tightsite **LOGGED:** JS **CASING:** HQ to 2.5 m
TYPE OF BORING: Diatube (150mm dia) to 0.15m, hand auger to 1.8m, rotary washbore to 2.5m, NMLC coring to 12m
WATER OBSERVATIONS: Free groundwater observed at 1.2m
REMARKS: Co-ordinates interpolated relative to site features. Surface level taken from Synman Justin Blalek Architects Pty Ltd, Job 4000, Drawing No. WD05, Rev D, dated 29 July 1989. Borehole re-instated using cement grout.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 14.0 AHD
EASTING: 333933.5
NORTHING: 6249269
DIP/AZIMUTH: 90°/--

BORE No: BH2002
PROJECT No: 86884.02
DATE: 21 - 23/6/2021
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (XW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
14	0.08	CONCRETE SLAB: no steel reinforcement observed							A/E			PID<1
		FILL/SAND: medium, brown, with concrete, brick and ceramic tile rubble, sandstone and igneous gravel and cobbles (up to 130mm), moist, generally in a medium dense condition							A/E			PID<1
	0.6	SAND SW: medium, pale grey and brown, moist, dense to very dense, alluvial soil										
13	1	Below 0.95m: wet				21-06-21			A/E			PID<1
		Below 1.2m: medium dense to very dense						Unless otherwise stated, rock is fractured along rough, planar bedding dipping 0-10°, with ironstaining or clay coating				
	1.65	Sandy CLAY CL-CI: low to medium plasticity, pale grey and brown, fine sand, w<=PL, very stiff, residual soil										
12	1.95	Sandy CLAY CL-CI: low to medium plasticity, brown and red-brown, fine sand, w<=PL, very stiff to hard, relict rock texture, extremely weathered sandstone										
	2.47	SANDSTONE: medium grained, brown, red-brown and pale grey, very low strength with medium to high strength bands, highly weathered with extremely weathered bands, fractured, Mittagong Formation						2.51m: Ds, 50mm 2.58m: B20°, pl, ro, cly vn 2.61m: B20°, pl, ro, cly co 2.63m: Ds, 40mm 2.71m: Ds, 70mm 3.00m: Ds, 240mm	C	100	0	PL(A) = 0.9
11	3											
	3.24	SANDSTONE: medium to coarse grained, pale grey and brown, low then medium to high strength, highly weathered to slightly weathered, slightly fractured, Hawkesbury Sandstone						3.24m: J70°, pl, ro, cly co 3.30-3.42m: J70°, pl, ro, cly co 3.41m: Ds, 10mm				PL(A) = 0.2
								3.90m: Ds, 2mm	C	100	48	PL(A) = 1.1
10	4											
	4.28	SANDSTONE: medium to coarse grained, with fine to medium grained bands, pale grey, distinctly and indistinctly cross-bedded at 0-10°, thinly to medium bedded, medium to high strength with bands of medium or high strength, fresh, slightly fractured to unbroken, Hawkesbury Sandstone							C	100	100	PL(A) = 1

RIG: Proline **DRILLER:** Tightsite **LOGGED:** JS **CASING:** HQ to 2.1m
TYPE OF BORING: Diatube (150mm dia) to 0.08m, hand auger to 1.0m, rotary washbore to 2.12m, NMLC coring to 12m

WATER OBSERVATIONS: Free groundwater observed at 0.95m

REMARKS: Co-ordinates interpolated relative to site features. Surface level taken from Synman Justin Blalek Architects Pty Ltd, Job 4000, Drawing No. WD05, Rev D, dated 29 July 1989. Borehole re-instated using cement grout.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 14.0 AHD
EASTING: 333933.5
NORTHING: 6249269
DIP/AZIMUTH: 90°/--

BORE No: BH2002
PROJECT No: 86884.02
DATE: 21 - 23/6/2021
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (XW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
9		SANDSTONE: medium to coarse grained, with fine to medium grained bands, pale grey, distinctly and indistinctly cross-bedded at 0-10°, thinly to medium bedded, medium to high strength with bands of medium or high strength, fresh, slightly fractured to unbroken, Hawkesbury Sandstone *(continued)*							C	100	100	
8	6											PL(A) = 0.8
												PL(A) = 1.5
7	7								C	100	100	
												PL(A) = 0.9
		Below 7.6m: medium to high strength, thinly to thickly bedded						7.61-8.11m: J80°, pl, ro, cly vn (partially healed)				
6	8								C	100	100	
5	9											PL(A) = 1.1
		Below 9.3m: high strength										PL(A) = 1.5
									C	100	100	

RIG: Proline **DRILLER:** Tightsite **LOGGED:** JS **CASING:** HQ to 2.1m
TYPE OF BORING: Diatube (150mm dia) to 0.08m, hand auger to 1.0m, rotary washbore to 2.12m, NMLC coring to 12m

WATER OBSERVATIONS: Free groundwater observed at 0.95m

REMARKS: Co-ordinates interpolated relative to site features. Surface level taken from Synman Justin Blalek Architects Pty Ltd, Job 4000, Drawing No. WD05, Rev D, dated 29 July 1989. Borehole re-instated using cement grout.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Toga Development and Construction Pty Ltd
PROJECT: Proposed Commercial Development
LOCATION: 2-8a Lee Street, Haymarket

SURFACE LEVEL: 14.0 AHD
EASTING: 333933.5
NORTHING: 6249269
DIP/AZIMUTH: 90°/--

BORE No: BH2002
PROJECT No: 86884.02
DATE: 21 - 23/6/2021
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (XW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
4		SANDSTONE: medium to coarse grained, with fine to medium grained bands, pale grey, distinctly and indistinctly cross-bedded at 0-10°, thinly to medium bedded, medium to high strength with bands of medium or high strength, fresh, slightly fractured to unbroken, Hawkesbury Sandstone *(continued)*										PL(A) = 1.3
3	11								C	100	100	
												PL(A) = 1.5
2	12 12.0	Bore discontinued at 12.0m - Target depth										
1	13											
0	14											

RIG: Proline **DRILLER:** Tightsite **LOGGED:** JS **CASING:** HQ to 2.1m

TYPE OF BORING: Diatube (150mm dia) to 0.08m, hand auger to 1.0m, rotary washbore to 2.12m, NMLC coring to 12m

WATER OBSERVATIONS: Free groundwater observed at 0.95m

REMARKS: Co-ordinates interpolated relative to site features. Surface level taken from Synman Justin Blalek Architects Pty Ltd, Job 4000, Drawing No. WD05, Rev D, dated 29 July 1989. Borehole re-instated using cement grout.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Sampling Methods

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Sampling

Sampling is carried out during drilling or test pitting to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on colour, type, inclusions and, depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples are taken by pushing a thin-walled sample tube into the soil and withdrawing it to obtain a sample of the soil in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Test Pits

Test pits are usually excavated with a backhoe or an excavator, allowing close examination of the in-situ soil if it is safe to enter into the pit. The depth of excavation is limited to about 3 m for a backhoe and up to 6 m for a large excavator. A potential disadvantage of this investigation method is the larger area of disturbance to the site.

Large Diameter Augers

Boreholes can be drilled using a rotating plate or short spiral auger, generally 300 mm or larger in diameter commonly mounted on a standard piling rig. The cuttings are returned to the surface at intervals (generally not more than 0.5 m) and are disturbed but usually unchanged in moisture content. Identification of soil strata is generally much more reliable than with continuous spiral flight augers, and is usually supplemented by occasional undisturbed tube samples.

Continuous Spiral Flight Augers

The borehole is advanced using 90-115 mm diameter continuous spiral flight augers which are withdrawn at intervals to allow sampling or in-situ testing. This is a relatively economical means of drilling in clays and sands above the water table. Samples are returned to the surface, or may be collected after withdrawal of the auger flights, but they are disturbed and may be mixed with soils from the sides of the hole. Information from the drilling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively low reliability, due to the remoulding, possible mixing or softening of samples by groundwater.

Non-core Rotary Drilling

The borehole is advanced using a rotary bit, with water or drilling mud being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from the rate of penetration. Where drilling mud is used this can mask the cuttings and reliable identification is only possible from separate sampling such as SPTs.

Continuous Core Drilling

A continuous core sample can be obtained using a diamond tipped core barrel, usually with a 50 mm internal diameter. Provided full core recovery is achieved (which is not always possible in weak rocks and granular soils), this technique provides a very reliable method of investigation.

Standard Penetration Tests

Standard penetration tests (SPT) are used as a means of estimating the density or strength of soils and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289, Methods of Testing Soils for Engineering Purposes - Test 6.3.1.

The test is carried out in a borehole by driving a 50 mm diameter split sample tube under the impact of a 63 kg hammer with a free fall of 760 mm. It is normal for the tube to be driven in three successive 150 mm increments and the 'N' value is taken as the number of blows for the last 300 mm. In dense sands, very hard clays or weak rock, the full 450 mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form.

- In the case where full penetration is obtained with successive blow counts for each 150 mm of, say, 4, 6 and 7 as:

  4,6,7
  N=13

- In the case where the test is discontinued before the full penetration depth, say after 15 blows for the first 150 mm and 30 blows for the next 40 mm as:

  15, 30/40 mm

The results of the SPT tests can be related empirically to the engineering properties of the soils.

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

Dynamic penetrometer tests (DCP or PSP) are carried out by driving a steel rod into the ground using a standard weight of hammer falling a specified distance. As the rod penetrates the soil the number of blows required to penetrate each successive 150 mm depth are recorded. Normally there is a depth limitation of 1.2 m, but this may be extended in certain conditions by the use of extension rods. Two types of penetrometer are commonly used.

- Perth sand penetrometer - a 16 mm diameter flat ended rod is driven using a 9 kg hammer dropping 600 mm (AS 1289, Test 6.3.3). This test was developed for testing the density of sands and is mainly used in granular soils and filling.
- Cone penetrometer - a 16 mm diameter rod with a 20 mm diameter cone end is driven using a 9 kg hammer dropping 510 mm (AS 1289, Test 6.3.2). This test was developed initially for pavement subgrade investigations, and correlations of the test results with California Bearing Ratio have been published by various road authorities.

Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are generally based on Australian Standard AS1726:2017, Geotechnical Site Investigations. In general, the descriptions include strength or density, colour, structure, soil or rock type and inclusions.

Soil Types

Soil types are described according to the predominant particle size, qualified by the grading of other particles present:

Type	Particle size (mm)
Boulder	>200
Cobble	63 - 200
Gravel	2.36 - 63
Sand	0.075 - 2.36
Silt	0.002 - 0.075
Clay	<0.002

The sand and gravel sizes can be further subdivided as follows:

Type	Particle size (mm)
Coarse gravel	19 - 63
Medium gravel	6.7 - 19
Fine gravel	2.36 – 6.7
Coarse sand	0.6 - 2.36
Medium sand	0.21 - 0.6
Fine sand	0.075 - 0.21

Definitions of grading terms used are:

- Well graded - a good representation of all particle sizes
- Poorly graded - an excess or deficiency of particular sizes within the specified range
- Uniformly graded - an excess of a particular particle size
- Gap graded - a deficiency of a particular particle size with the range

The proportions of secondary constituents of soils are described as follows:

In fine grained soils (>35% fines)

Term	Proportion of sand or gravel	Example
And	Specify	Clay (60%) and Sand (40%)
Adjective	>30%	Sandy Clay
With	15 – 30%	Clay with sand
Trace	0 - 15%	Clay with trace sand

In coarse grained soils (>65% coarse)
- with clays or silts

Term	Proportion of fines	Example
And	Specify	Sand (70%) and Clay (30%)
Adjective	>12%	Clayey Sand
With	5 - 12%	Sand with clay
Trace	0 - 5%	Sand with trace clay

In coarse grained soils (>65% coarse)
- with coarser fraction

Term	Proportion of coarser fraction	Example
And	Specify	Sand (60%) and Gravel (40%)
Adjective	>30%	Gravelly Sand
With	15 - 30%	Sand with gravel
Trace	0 - 15%	Sand with trace gravel

The presence of cobbles and boulders shall be specifically noted by beginning the description with ‘Mix of Soil and Cobbles/Boulders’ with the word order indicating the dominant first and the proportion of cobbles and boulders described together.

Soil Descriptions

Cohesive Soils

Cohesive soils, such as clays, are classified on the basis of undrained shear strength. The strength may be measured by laboratory testing, or estimated by field tests or engineering examination. The strength terms are defined as follows:

Description	Abbreviation	Undrained shear strength (kPa)
Very soft	VS	<12
Soft	S	12 - 25
Firm	F	25 - 50
Stiff	St	50 - 100
Very stiff	VSt	100 - 200
Hard	H	>200
Friable	Fr	-

Cohesionless Soils

Cohesionless soils, such as clean sands, are classified on the basis of relative density, generally from the results of standard penetration tests (SPT), cone penetration tests (CPT) or dynamic penetrometers (PSP). The relative density terms are given below:

Relative Density	Abbreviation	Density Index (%)
Very loose	VL	<15
Loose	L	15-35
Medium dense	MD	35-65
Dense	D	65-85
Very dense	VD	>85

Soil Origin

It is often difficult to accurately determine the origin of a soil. Soils can generally be classified as:

- Residual soil - derived from in-situ weathering of the underlying rock;
- Extremely weathered material – formed from in-situ weathering of geological formations. Has soil strength but retains the structure or fabric of the parent rock;
- Alluvial soil – deposited by streams and rivers;
- Estuarine soil – deposited in coastal estuaries;
- Marine soil – deposited in a marine environment;
- Lacustrine soil – deposited in freshwater lakes;
- Aeolian soil – carried and deposited by wind;
- Colluvial soil – soil and rock debris transported down slopes by gravity;
- Topsoil – mantle of surface soil, often with high levels of organic material.
- Fill – any material which has been moved by man.

Moisture Condition – Coarse Grained Soils

For coarse grained soils the moisture condition should be described by appearance and feel using the following terms:

- Dry (D) Non-cohesive and free-running.
- Moist (M) Soil feels cool, darkened in colour.
  Soil tends to stick together.
  Sand forms weak ball but breaks easily.
- Wet (W) Soil feels cool, darkened in colour.
  Soil tends to stick together, free water forms when handling.

Moisture Condition – Fine Grained Soils

For fine grained soils the assessment of moisture content is relative to their plastic limit or liquid limit, as follows:

- ‘Moist, dry of plastic limit’ or ‘w <PL’ (i.e. hard and friable or powdery).
- ‘Moist, near plastic limit’ or ‘w ≈ PL (i.e. soil can be moulded at moisture content approximately equal to the plastic limit).
- ‘Moist, wet of plastic limit’ or ‘w >PL’ (i.e. soils usually weakened and free water forms on the hands when handling).
- ‘Wet’ or ‘w ≈LL’ (i.e. near the liquid limit).
- ‘Wet’ or ‘w >LL’ (i.e. wet of the liquid limit).

Rock Strength

Rock strength is defined by the Unconfined Compressive Strength and it refers to the strength of the rock substance and not the strength of the overall rock mass, which may be considerably weaker due to defects.

The Point Load Strength Index $Is_{(50)}$ is commonly used to provide an estimate of the rock strength and site specific correlations should be developed to allow UCS values to be determined. The point load strength test procedure is described by Australian Standard AS4133.4.1-2007. The terms used to describe rock strength are as follows:

Strength Term	Abbreviation	Unconfined Compressive Strength MPa	Point Load Index * $Is_{(50)}$ MPa
Very low	VL	0.6 - 2	0.03 - 0.1
Low	L	2 - 6	0.1 - 0.3
Medium	M	6 - 20	0.3 - 1.0
High	H	20 - 60	1 - 3
Very high	VH	60 - 200	3 - 10
Extremely high	EH	>200	>10

* Assumes a ratio of 20:1 for UCS to $Is_{(50)}$. It should be noted that the UCS to $Is_{(50)}$ ratio varies significantly for different rock types and specific ratios should be determined for each site.

Degree of Weathering

The degree of weathering of rock is classified as follows:

Term	Abbreviation	Description
Residual Soil	RS	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.
Extremely weathered	XW	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible
Highly weathered	HW	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.
Moderately weathered	MW	The whole of the rock material is discoloured , usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable, but shows little or no change of strength from fresh rock.
Slightly weathered	SW	Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.
Fresh	FR	No signs of decomposition or staining.
Note: If HW and MW cannot be differentiated use DW (see below)		
Distinctly weathered	DW	Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching or may be decreased due to deposition of weathered products in pores.

Rock Descriptions

Degree of Fracturing

The following classification applies to the spacing of natural fractures in diamond drill cores. It includes bedding plane partings, joints and other defects, but excludes drilling breaks.

Term	Description
Fragmented	Fragments of <20 mm
Highly Fractured	Core lengths of 20-40 mm with occasional fragments
Fractured	Core lengths of 30-100 mm with occasional shorter and longer sections
Slightly Fractured	Core lengths of 300 mm or longer with occasional sections of 100-300 mm
Unbroken	Core contains very few fractures

Rock Quality Designation

The quality of the cored rock can be measured using the Rock Quality Designation (RQD) index, defined as:

$$\text{RQD \%} = \frac{\text{cumulative length of 'sound' core sections} \geq \text{100 mm long}}{\text{total drilled length of section being assessed}}$$

where 'sound' rock is assessed to be rock of low strength or stronger. The RQD applies only to natural fractures. If the core is broken by drilling or handling (i.e. drilling breaks) then the broken pieces are fitted back together and are not included in the calculation of RQD.

Stratification Spacing

For sedimentary rocks the following terms may be used to describe the spacing of bedding partings:

Term	Separation of Stratification Planes
Thinly laminated	< 6 mm
Laminated	6 mm to 20 mm
Very thinly bedded	20 mm to 60 mm
Thinly bedded	60 mm to 0.2 m
Medium bedded	0.2 m to 0.6 m
Thickly bedded	0.6 m to 2 m
Very thickly bedded	> 2 m

Symbols & Abbreviations

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Introduction

These notes summarise abbreviations commonly used on borehole logs and test pit reports.

Drilling or Excavation Methods

C	Core drilling
R	Rotary drilling
SFA	Spiral flight augers
NMLC	Diamond core - 52 mm dia
NQ	Diamond core - 47 mm dia
HQ	Diamond core - 63 mm dia
PQ	Diamond core - 81 mm dia

Water

▷	Water seep
▽	Water level

Sampling and Testing

A	Auger sample
B	Bulk sample
D	Disturbed sample
E	Environmental sample
U_{50}	Undisturbed tube sample (50mm)
W	Water sample
pp	Pocket penetrometer (kPa)
PID	Photo ionisation detector
PL	Point load strength Is(50) MPa
S	Standard Penetration Test
V	Shear vane (kPa)

Description of Defects in Rock

The abbreviated descriptions of the defects should be in the following order: Depth, Type, Orientation, Coating, Shape, Roughness and Other. Drilling and handling breaks are not usually included on the logs.

Defect Type

B	Bedding plane
Cs	Clay seam
Cv	Cleavage
Cz	Crushed zone
Ds	Decomposed seam
F	Fault
J	Joint
Lam	Lamination
Pt	Parting
Sz	Sheared Zone
V	Vein

Orientation

The inclination of defects is always measured from the perpendicular to the core axis.

h	horizontal
v	vertical
sh	sub-horizontal
sv	sub-vertical

Coating or Infilling Term

cln	clean
co	coating
he	healed
inf	infilled
stn	stained
ti	tight
vn	veneer

Coating Descriptor

ca	calcite
cbs	carbonaceous
cly	clay
fe	iron oxide
mn	manganese
slt	silty

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

fg	fragmented
bnd	band
qtz	quartz

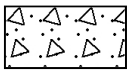
Symbols & Abbreviations

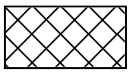
Graphic Symbols for Soil and Rock

General

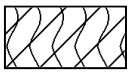

Asphalt

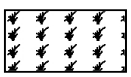

Road base

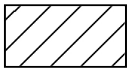

Concrete

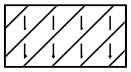

Filling

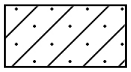
Soils


Topsoil

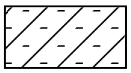

Peat

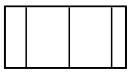

Clay

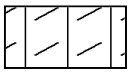

Silty clay

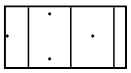

Sandy clay

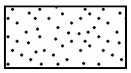

Gravelly clay

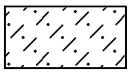

Shaly clay

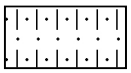

Silt


Clayey silt


Sandy silt

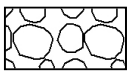

Sand

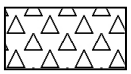

Clayey sand


Silty sand


Gravel

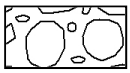

Sandy gravel


Cobbles, boulders

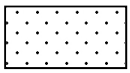

Talus

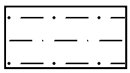
Sedimentary Rocks

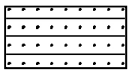

Boulder conglomerate

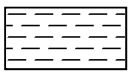

Conglomerate


Conglomeratic sandstone

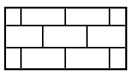

Sandstone


Siltstone

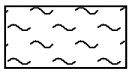

Laminite

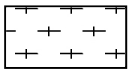

Mudstone, claystone, shale

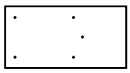

Coal


Limestone

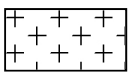
Metamorphic Rocks

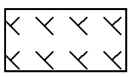

Slate, phyllite, schist

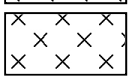

Gneiss

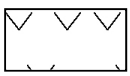

Quartzite

Igneous Rocks


Granite


Dolerite, basalt, andesite


Dacite, epidote


Tuff, breccia


Porphyry

Appendix F

Site Assessment Criteria

Appendix F
Site Assessment Criteria
2-8a Lee Street, Haymarket

D1.0 Introduction

D1.1 Guidelines

The following key guidelines were consulted for deriving the site assessment criteria (SAC):

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013).
- CRC CARE *Health screening levels for petroleum hydrocarbons in soil and groundwater* (CRC CARE, 2011).
- ANZG *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG, 2018).

D1.2 General

The SAC applied in the current investigation are informed by the CSM which identified human and environmental receptors to potential contamination at the site. Analytical results are assessed (as a Tier 1 assessment) against the SAC comprising primarily the investigation and screening levels of Schedule B1 of NEPC (2013).

The following inputs are relevant to the selection and/or derivation of the SAC:

- Land use: commercial / industrial;
- Corresponding to land use category 'D', commercial / industrial such as shops, offices, factories and industrial sites; and
- Soil type: clay, silt, and sand.

D2.0 Soils

D2.1 Health Investigation and Screening Levels

The generic health investigation levels (HIL) and health screening levels (HSL) are considered to be appropriate for the assessment of human health risk via all relevant pathways of exposure associated with contamination at the site. The adopted soil HIL and HSL for the contaminants of concern are in Table 1 and Table2.

Table 1: Health Investigation Levels (mg/kg)

Contaminant	HIL-D
Metals	
Arsenic	3000
Cadmium	900
Chromium (VI)	3600
Copper	240 000
Lead	1500
Mercury (inorganic)	730
Nickel	6000
Zinc	400 000
PAH	
B(a)P TEQ	40
Total PAH	4000
Phenols	
Phenol	240 000
Pentachlorophenol	660
OCP	
DDT+DDE+DDD	3600
Aldrin and dieldrin	45
Chlordane	530
Endosulfan	2000
Endrin	100
Heptachlor	50
HCB	80
Methoxychlor	2500
OPP	
Chlorpyrifos	2000
PCB	
PCB	7
VOC (various analytes)	-

Table 2: Health Screening Levels (mg/kg)

Contaminant	HSL-D	HSL-D	HSL-D	HSL-D
CLAY	**0 m to <1 m**	**1 m to <2 m**	**2 m to <4 m**	**4 m+**
Benzene	4	6	9	20
Toluene	NL	NL	NL	NL
Ethylbenzene	NL	NL	NL	NL
Xylenes	NL	NL	NL	NL
Naphthalene	NL	NL	NL	NL
TRH F1	310	480	NL	NL
TRH F2	NL	NL	NL	NL

Notes: TRH F1 is TRH C_6-C_{10} minus BTEX

TRH F2 is TRH >C_{10}-C_{16} minus naphthalene

The soil saturation concentration (Csat) is defined as the soil concentration at which the porewater phase cannot dissolve any more of an individual chemical. The soil vapour that is in equilibrium with the porewater will be at its maximum. If the derived soil HSL exceeds Csat, a soil vapour source concentration for a petroleum mixture could not exceed a level that would results in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or 'NL'

The HSL for direct contact derived from CRC CARE (2011) are in Table 3.

Table 3: Health Screening Levels for Direct Contact (mg/kg)

Contaminant	DC HSL-D
Benzene	430
Toluene	99 000
Ethylbenzene	27 000
Xylenes	81 000
Naphthalene	11 000
TRH F1	26 000
TRH F2	20 000
TRH F3	27 000
TRH F4	38 000

Notes: TRH F1 is TRH C_6-C_{10} minus BTEX

TRH F2 is TRH >C_{10}-C_{16} minus naphthalene

IMW intrusive maintenance worker

D2.2 Ecological Investigation Levels

EIL and ESL - Schedule B5A of NEPC (2013) states that the aim *of the EILs is that varying levels of protection will be provided to the following ecological receptors at all sites:*

- Biota supporting ecological processes, including microorganisms and soil invertebrates;
- Native flora and fauna;
- Introduced flora and fauna; and
- Transitory or permanent wildlife.

Furthermore, Schedule B5A of NEPC (2013) states that *Commercial and industrial land, particularly in long-established industrial areas, is often heavily contaminated by past activities or fill materials used to level the area. In these cases, jurisdictions may determine that HILs are the most appropriate soil quality criteria and that EILs are not applicable.*

In determining the relevance of EILs and ESLs the presence or absence of sensitive ecological receptors must be considered. In this regard both the potential ecological receptors on and off-site must be considered and the current / proposed development.

The Site is located in a commercial / retail precinct. The following potential ecological receptors were identified:

- Darling Harbour and Blackwattle Bay - 1 km NNW to NW of the Site;
- Belmore Park - 300 m north-east of the Site; and
- Victoria Park - 1,000 m west of the Site.

Based on the inferred assessment of the direction of groundwater flow (NNW) it is considered unlikely that these potential receptors would be impacted by soil contamination at the site.

The site is currently occupied by Adinal Hotel and Henry Deane Plaza (commercial/retail) with the surfaces covered with concrete or bitumen pavements. Furthermore, the proposed development will include excavation of basement levels across most of the site's footprint with minimal landscaping. The value of the Site for soil organisms and the risk of exposure of soil contamination to transitory wildlife are considered very low, and that human health risk screening levels are more appropriate, and EIL and ESL are not relevant to the current assessment.

D2.3 Asbestos in Soil

The HSL for asbestos in soil are based on likely exposure levels for different scenarios published in NEPC (2013) for the following forms of asbestos:

- Bonded asbestos containing material (ACM); and
- Fibrous asbestos and asbestos fines (FA and AF).

The HSL are in Table 4.

Table 4: Health Screening Levels for Asbestos

Form of Asbestos	HSL-D
ACM	0.05%
FA and AF	0.001%
FA and AF and ACM	No visible asbestos for surface soil *

Notes: Surface soils defined as top 10 cm.
* Based on site observations at the sampling points and the analytical results of surface samples.

D2.4 Management Limits

In addition to appropriate consideration and application of the HSL and ESL, there are additional considerations which reflect the nature and properties of petroleum hydrocarbons, including:

- Formation of observable light non-aqueous phase liquids (LNAPL);
- Fire and explosion hazards; and
- Effects on buried infrastructure e.g., penetration of, or damage to, in-ground services.

The adopted management limits are in Table 5.

Table 5: Management Limits (mg/kg)

Contaminant	Soil Type	ML-D
TRH F1	Coarse	700
TRH F2	Coarse	1000
TRH F3	Coarse	3500
TRH F4	Coarse	10 000

Notes: TRH F1 is TRH C_6-C_{10} including BTEX
TRH F2 is TRH >C_{10}-C_{16} including naphthalene

D3.0 Soil Vapour

D3.1 Interim Soil Vapour Health Investigation Levels

Soil vapour interim HIL for specific chlorinated VOC were published by NEPC (2013) to assess the vapour intrusion exposure pathway.

The interim HIL for chlorinated VOC methodology employs a simple though conservative approach using an attenuation factor that relates the concentration of a volatile contaminant in indoor air to the concentration in soil gas immediately below a building foundation slab.

The interim health investigation levels (IHIL) derived from NEPC (2013) are in Table 6.

Table 6: Soil Vapour Interim Health Investigation Levels for Chlorinated Hydrocarbons (µg/m^3)

Chemical	IHIL-D
TCE	80
1,1,1–TCA	230 000
PCE	8000
cis-DCE	300
VC	100

Notes: TCE Trichloroethene
1,1,1–TCA 1,1,1-trichloroethane
PCE Tetrachloroethene
cis-DCE cis-1,2-dichloroethene
VC Vinyl chloride

D3.2 Health Screening Levels

Soil vapour HSL for petroleum hydrocarbons were published by NEPC (2013) to assess the vapour intrusion exposure pathway.

The HSL derived from NEPC (2013) are in Table 7.

Table 7: Soil Vapour Health Screening Levels for Vapour Intrusion (µg/m^3)

Contaminant	HSL-D	HSL-D	HSL-D	HSL-D	HSL-D
CLAY	0-1 m	1-2 m	2-4 m	4-8 m	>8 m
Benzene	5000	80 000	230 000	530 000	1 100 000
Toluene	6 500 000	100 000 000	NL	NL	NL
Ethylbenzene	1 800 000	31 000 000	NL	NL	NL
Xylene Total	1 200 000	21 000 000	NL	NL	NL
Naphthalene	4000	85 000	240 000	560 000	1 200 000
TRH F1	1 000 000	19 000 000	55 000 000	130 000 000	270 000 000
TRH F2	800 000	NL	NL	NL	NL

Notes: TRH F1 is TRH C_6-C_{10} minus BTEX
TRH F2 is TRH >C_{10}-C_{16} minus naphthalene
The maximum possible soil vapour concentrations have been calculated based on vapour pressures of the pure chemicals. Where soil vapour HSL exceed these values, a soil-specific source concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or 'NL'

D4.0 Groundwater

D4.1 Introduction

The groundwater investigation levels (GIL) used for interpretation of the groundwater data (as a Tier 1 assessment) have been selected based on the potential risks posed from contamination sourced from the site to receptors at or down-gradient of the site, as identified by the conceptual site model (CSM). The receptors, exposure points and pathways are summarised in Table 8.

Table 8: Summary of Potential Receptors and Potential Risks

Receptor	Location	Exposure Point	Exposure Pathway
Surface water aquatic ecosystem	Down-gradient from site.	Receiving surface water body at the groundwater discharge point.	Exposure to contaminants.
Occupants of buildings	On site and down-gradient from site.	Enclosed buildings (existing or proposed).	Inhalation of VOC (including TRH and BTEX) overlying VOC impacted groundwater via the vapour intrusion pathway.

The rationale for the selection of GIL is in Table 9.

Table 9: Groundwater Investigation Level Rationale

Receptor / Beneficial Use	GIL	Source	Comments / Rationale
Aquatic ecosystem	DGV	ANZG (2018)	Freshwater 95% LOP for non-bioaccumulative contaminants
Building occupants (vapour intrusion)	HSL	NEPC (2013)	2 m to <4 m / 4 m to <8 m / 8 m+

Notes: DGV default guideline value
HSL health screening level

D4.2 Groundwater Investigation Levels for Aquatic Ecosystems

The DGV for the protection of aquatic ecosystems derived from ANZG (2018) are in Table 10.

Table 10: Groundwater Investigation Levels for Protection of Aquatic Ecosystems (µg/L)

Contaminant	Fresh Water
Metals	
Arsenic	24 as As(III) 13 as As(V)
Cadmium	0.2-0.6

Contaminant	Fresh Water
Chromium (VI)	1
Copper	1.4
Lead	4.4-17.7
Manganese	1900
Mercury (inorganic)	0.6
Nickel	13.1-33.2
Zinc	9.6-24.1
PAH	
B(a)P TEQ	0.2
Total PAH	-
Naphthalene	16
Anthracene	0.4
Fluoranthene	1.4
Phenanthrene	2.0
BTEX	
Benzene	950
Toluene	180
Ethylbenzene	80
Xylene (o)	350
Xylene (p)	200
Xylene (m)	75
Phenols	
Phenol	320
Pentachlorophenol	3.6
OCP	
DDT+DDE+DDD	0.06
Aldrin and dieldrin	-
Chlordane	0.08
Endosulfan	0.2
Endrin	0.02
Heptachlor	0.09
Methoxychlor	0.005

Contaminant	Fresh Water
OPP	
Chlorpyrifos	0.01
PCB	
Arochlor 1242	0.6
Arochlor 1254	0.03

D4.3 Health Screening Levels for Vapour Intrusion

The HSL to evaluate potential vapour intrusion risks derived from NEPC (2013) are in Table 11.

Table 11: Groundwater Health Screening Levels for Vapour Intrusion (µg/L)

Contaminant	HSL-D	HSL-D	HSL-D	Solubility Limit
CLAY	**2 m to <4 m**	**4 m to <8 m**	**8 m+**	**-**
Benzene	30 000	30 000	35 000	59 000
Toluene	NL	NL	NL	61 000
Ethylbenzene	NL	NL	NL	3900
Xylenes	NL	NL	NL	21 000
Naphthalene	NL	NL	NL	170
TRH F1	NL	NL	NL	9000
TRH F2	NL	NL	NL	3000

Notes: TRH F1 is TRH C_6-C_{10} minus BTEX

TRH F2 is TRH >C_{10}-C_{16} minus naphthalene

The solubility limit is defined as the groundwater concentration at which the water cannot dissolve any more of an individual chemical based on a petroleum mixture. The soil vapour that is in equilibrium with the groundwater will be at its maximum. If the derived groundwater HSL exceeds the water solubility limit, a soil vapour source concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or 'NL'.

D5.0 References

ANZECC. (2000). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* Australia and New Zealand Environment and Conservation Council.

ANZG. (2018). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* Canberra, ACT: Australian and New Zealand Governments and Australian state and territory governments.

CRC CARE. (2011). *Health screening levels for petroleum hydrocarbons in soil and groundwater.* Parts 1 to 3, Technical Report No. 10: Cooperative Research Centre for Contamination Assessment and Remediation of the Environment.

HEPA. (2020). *PFAS National Environmental Management Plan (NEMP).* Version 2.0: Heads of EPAs Australia and New Zealand and Australian Government Department of the Environment.

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM].* Australian Government Publishing Services Canberra: National Environment Protection Council.

NHMRC. (2008). *Guidelines for Managing Risks In Recreational Water.*

NHMRC, NRMMC. (2016). *Australian Drinking Water Guidelines 6 2011, Version 3.2.* Canberra: National Health and Medical Research Council, National Resource Management Ministerial Council.

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Appendix G

Data Quality Objectives

Appendix G
Data Quality Objectives
2-8a Lee Street, Haymarket

G1.0 Data Quality Objectives

The DSI has been devised broadly in accordance with the seven-step data quality objective (DQO) process which is provided in Appendix B, Schedule B2 of NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013).

Step	Summary
1: State the problem	The objective of the investigation is to confirm the contamination status of the site with respect to the proposed land use. The report is being undertaken as the land is to be redeveloped. The requirements of the regulator, City of Sydney Council, will also be considered by consulting their Development Control Plan (DCP), Local Environment Plan (LEP) and any other requirements based on our recent experience with Council on similar sites. A preliminary conceptual site model (CSM) has been prepared (Section 6) for the proposed development. The project team consisted of experienced environmental engineers and scientists working in the roles of Project Principal, Project Reviewer, Project Manager, field staff.
2: Identify the decisions / goal of the study	The site history has identified possible contaminating previous uses which are identified in the CSM (Section 6). The CSM identifies the associated contaminants of potential concern (COPC) and the likely impacted media. The site assessment criteria (SAC) for each of the COPC are detailed in Appendix F. The decision is to establish whether or not the results fall below the SAC. On this basis, an assessment of the site's suitability from a contamination perspective will be derived and a decision made on whether (or not) further assessment and / or remediation will be required.
3: Identify the information inputs	Inputs to the investigation will be the results of analysis of samples to measure the concentrations of COPC identified in the CSM (Section 6) at the site using NATA accredited laboratories and methods, where possible. The SAC for each of the COPC are detailed in Appendix F. A photoionization detector (PID) will be used on-site to screen soils for VOC. PID readings will be used to inform sample selection for laboratory analysis.
4: Define the study boundaries	The lateral boundaries of the investigation area are shown on Drawing 1, Appendix B. The vertical boundaries are to the extent of contamination impact as determined from the site history assessment and site observations. The assessment is limited to the timeframe over which the field investigation was undertaken. Constraints to the assessment are identified and discussed in the conclusions of the report, Section 11.

Step	Summary
5: Develop the analytical approach (or decision rule)	The decision rule is to compare all analytical results with SAC (Appendix F, based on NEPC (2013)). Where guideline values are absent, other sources of guideline values accepted by NEPC (2013) shall be adopted where possible. Where a sample result exceeds the adopted criterion, a further site-specific assessment will be made as to the risk posed by the presence of that contaminant(s). Initial comparisons will be with individual results then, where required, summary statistics (including mean, standard deviation and 95% upper confidence limit (UCL) of the arithmetic mean (95% UCL)) to assess potential risks posed by the site contamination. Quality control results are to be assessed according to their relative percent difference (RPD) values. For field duplicates, triplicates and laboratory results, RPDs should generally be below 30%; for field blanks and rinsates, results should be at or less than the limits of reporting (NEPC, 2013). The field and laboratory quality assurance assessment is included in Appendix C.
6: Specify the performance or acceptance criteria	Baseline condition: Contaminants at the site exceed human health and environmental SAC and pose a potentially unacceptable risk to receptors (null hypothesis). Unless conclusive information from the collected data is sufficient to reject the null hypothesis, it is assumed that the baseline condition is true. Uncertainty that may exist due to the above potential decision errors shall be mitigated as follows: As well as a primary screening exercise, the use of the 95% UCL as per NEPC (2013) may be applied, i.e.: 95% is the defined confidence level associated with the UCL on the geometric mean for contaminant data. The resultant 95%UCL shall subsequently be screened against the corresponding SAC. The statistical assessment will only be able to be applied to certain data-sets, such as those obtained via systematic sampling. Identification of areas for targeted sampling will be via professional judgement and errors will not be able to have a probability assigned to them.
7: Optimise the design for obtaining data	As the purpose of the sampling program is to assess for potential contamination across the site, the sampling program is reliant on professional judgement to identify and sample the potentially affected areas. Further details regarding the proposed sampling plan are presented in Section 7.

G2.0 Field and Laboratory Data Quality Assurance and Quality Control

The field and laboratory data QA / QC procedures and results are summarised in the following Table 1. Reference should be made to the field work methodology and the laboratory results / certificates of analysis for further details. The relative percentage difference (RPD) results, along with the other field QC samples are included at the end of this appendix.

Table 1: Field and Laboratory Quality Control

Item	DP's Adopted Evaluation / Acceptance Criteria	Compliance
Analytical laboratories used	NATA accreditation	C
Holding times	Various based on type of analysis	C
Intra-laboratory replicates	5% of primary samples; <30% RPD	PC
Inter-laboratory replicates	5% of primary samples; <30% RPD	PC
Trip Spikes	1 per sampling event; 60-140% recovery	C
Trip Blanks	1 per sampling event; <PQL	C
Rinsates	1 per sampling event; <PQL	PC
Laboratory / Reagent Blanks	1 per batch; <PQL	C
Matrix Spikes	1 per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Surrogate Spikes	All organics analysis; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Control Samples	1 per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Standard Operating Procedures (SOP)	Adopting SOP for all aspects of the sampling field work	C

Notes:
C = compliance; PC = partial compliance; NC = non-compliance

The RPD results were all within the acceptable range based on DP's adopted evaluation criterion, with the exception of those indicated in Table QA1 and QA2. The exceedances are not, however, considered to be of concern given that:

- The typically low actual differences in the concentrations of the replicate pairs where some RPD exceedances occurred, particularly for groundwater;
- Actual results being less than five times the PQL which is not considered to be significant;
- Higher RPD results associated with replicate pair collected from fill soils which by its nature is heterogeneous;
- Replicates, rather than homogenised duplicates, were used to minimise risk of volatile loss, hence greater variability can be expected;
- Most of the recorded concentrations being relatively close to the PQL;
- The majority of RPDs within a replicate pair being within the acceptable limits; and
- All other QA / QC parameters met the DQIs.

In summary, it is considered that the QC data would be of sufficient quality to be considered acceptable to inform future assessments.

G3.0 Data Quality Indicators

The reliability of field procedures and analytical results was assessed against the following data quality indicators (DQIs) as outlined in NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013):

- Completeness: a measure of the amount of usable data from a data collection activity;
- Comparability: the confidence (qualitative) that data may be considered to be equivalent for each sampling and analytical event;
- Representativeness: the confidence (qualitative) of data representativeness of media present on-site;
- Precision: a measure of variability or reproducibility of data; and
- Accuracy: a measure of closeness of the data to the 'true' value.

Table 2: Data Quality Indicators

Data Quality Indicator	Method(s) of Achievement
Completeness	Selected target locations sampled.
	Preparation of borehole logs, sample location plan and chain of custody records.
	Preparation of field groundwater sampling sheets.
	Laboratory sample receipt information received confirming receipt of samples intact and appropriateness of the chain of custody.
	Completion of chain of custody (COC) documentation.
	NATA accredited laboratory results certificates provided by the laboratory.
	Satisfactory frequency and results for field and laboratory quality control (QC) samples as discussed in Section 1.
Comparability	Using appropriate techniques for sample recovery, storage and transportation, which were the same for the duration of the project.
	Experienced samplers used.
	Use of NATA registered laboratories, with test methods the same or similar between laboratories.
	Satisfactory results for field and laboratory QC samples.
Representativeness	Target media sampled.
	Sample numbers recovered and analysed are considered to be representative of the target media
	Samples were extracted and analysed within holding times.
	Samples were analysed in accordance with the COC.
Precision	Field staff followed standard operating procedures.
	Acceptable RPD between original samples and replicates.
	Satisfactory results for all other field and laboratory QC samples.
Accuracy	Field staff followed standard operating procedures.
	Satisfactory results for all field and laboratory QC samples.

Based on the above, it is considered that the DQIs have been generally complied with.

G4.0 Conclusion

Based on the results of the field QA and field and laboratory QC, and evaluation against the DQIs it is concluded that the field and laboratory test data obtained are reliable and would be considered useable for assessment purposes.

References

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM].* Australian Government Publishing Services Canberra: National Environment Protection Council.

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Table QA1: Relative Percentage Difference Results – Inter and Intra-laboratory Replicates (soil)

			Metals								TRH						BTEX				PAH			
			Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene [b]	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ	Total PAHs
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
BH1003A	1.9 - 2.0	10/03/2021	<4	<0.4	<1	<1	1	<0.1	<1	4	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	<0.05	<0.5	<0.05
BD3/100321	1.9 - 2.0	10/03/2021	<4	<0.4	<1	2	8	<0.1	<1	4	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	<0.05	<0.5	<0.05
[intra-lab]		Difference	0	0	0	1	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		RPD	0%	0%	0%	**67%**	**156%**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
BH1007	4..0- 4.45	16/03/2021	<4	<0.4	1	<1	<1	<0.1	<1	4	<25	76	<25	76	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
BD1/160321	4..0- 4.45	16/03/2021	<4	<0.4	1	<1	<1	<0.1	<1	6	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
[intra-lab]		Difference	0	0	0	0	0	0	0	2	0	26	0	26	0	0	0	0	0	0	0	0	0	0
		RPD	0%	0%	0%	0%	0%	0%	0%	**40%**	0%	**41%**	0%	**41%**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
BH1007	0.2 - 0.3	11/03/2021	<4	<0.4	9	24	53	0.3	7	50	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
BD1/110321	0.2 - 0.3	11/03/2021	<5	<1	2	<5	<5	<0.1	<2	7	<10	<50	<10	<50	<100	<100	<0.2	<0.5	<0.5	<1	NT	NT	NT	NT
[inter-lab]		Difference	0	0	7	19	48	0.2	5	43	0	0	0	0	0	0	0	0	0	0	-	-	-	-
		RPD	0%	0%	**127%**	**131%**	**166%**	**100%**	**111%**	**151%**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	-	-	-

Table QA2: Relative Percentage Difference Results – Intra-laboratory Replicates (groundwater)

		Metals - dissolved								TRH									BTEX				
		Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	C6-C9	C6-C10	F1 ((C6-C10)-BTEX)	C10-C14	C15-C28	C29-C36	C10-C16	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	m+p-xylene	o-xylene
Sample ID	Sample Date	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
BH1007	23/03/21	<1	<0.1	<1	<1	<1	<0.05	3	110	<10	<10	<10	<50	<100	<100	<50	<50	<100	<100	<1	<1	<1	<2	<1
BD1/230321	23/03/21	<1	0.2	<1	2	<1	<0.05	4	140	<10	<10	<10	<50	<100	<100	<50	<50	<100	<100	<1	<1	<1	<2	<1
[intra-lab]	Difference	0	0.1	0	1	0	0	1	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RPD	0%	**67%**	0%	**67%**	0%	0%	29%	24%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Table QA3: Trip Spike Results – Soils (% Recovery)

Sample ID	Benzene	Toluene	Ethylbenzene	o-Xylene	m+p-Xylene
TS	93	98	101	101	101

Table QA4: Trip Blank Results - Soils (mg/kg)

Sample ID	Benzene	Toluene	Ethylbenzene	o-Xylene	m+p-Xylene
TB	<0.2	<0.5	<1	<1	<2

Table QA5: Trip Spike Results – Water (% Recovery)

Sample ID	Benzene	Toluene	Ethylbenzene	o-Xylene	m+p-Xylene
TS	117	115	119	118	111

Table QA6: Trip Blank Results - Water (µg/L)

Sample ID	Benzene	Toluene	Ethylbenzene	o-Xylene	m+p-Xylene
TB	<1	<1	<1	<1	<2

Table QA7: Relative Percentage Difference Results – Intra-laboratory Replicates (groundwater)

		Metals - dissolved								TRH			BTEX					PAH
		Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	C6-C9	C6-C10	F1 ((C6-C10)-BTEX)	Benzene	Toluene	Ethylbenzene	m+p-xylene	o-xylene	Naphthalene
Sample ID	Sample Date	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/kg
Rinsate	23/03/21	<1	<0.1	<1	2	<1	<0.05	1	5	29	30	30	<1	<1	<1	<2	<1	<1

Appendix H

Groundwater Field Sheets

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Groundwater Field Sheet

Project and Bore Installation Details

Bore / Standpipe ID:	107A
Project Name:	
Project Number:	
Site Location:	
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	

Bore Development Details

Date/Time:	19/3/21 1:00
Purged By:	JB.
GW Level (pre-purge):	1.86 m bgl
Observed Well Depth:	3.76 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	5 L
Total Volume Purged:	7 (target: no drill mud, min 3 well vol. or dry) DRY (x2).
GW Level (post-purge):	3.73 m bgl
Equipment:	Twister pump + heater // Water: clear, no sheen, no odour.

Micropurge and Sampling Details

Date/Time:	
Sampled By:	
Weather Conditions:	
GW Level (pre-purge):	m bgl
Observed Well Depth:	m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	L
GW Level (post sample):	m bgl
Total Volume Purged:	L
Equipment:	

Water Quality Parameters

Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	***0.1° C***	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10%**	**+/- 10 mV**

Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):		m bgl,	
Sample Appearance (e.g. colour, siltiness, odour):			
Sample ID:			
QA/QC Samples:			
Sampling Containers and filtration:			
Comments / Observations:			

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Groundwater Field Sheet

Project and Bore Installation Details	
Bore / Standpipe ID:	107 B R
Project Name:	
Project Number:	
Site Location:	
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	

Bore Development Details	
Date/Time:	19/3/2021 1:30
Purged By:	JB
GW Level (pre-purge):	2.16. m bgl
Observed Well Depth:	10.90 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	25 L
Total Volume Purged:	50. (target: no drill mud, min 3 well vol. or dry) DRY (x2)
GW Level (post-purge):	10.88 m bgl
Equipment:	Twister pump // Water: dark grey, semi-translucent, sulphurous odour, no sheen.

Micropurge and Sampling Details	
Date/Time:	
Sampled By:	
Weather Conditions:	
GW Level (pre-purge):	m bgl
Observed Well Depth:	m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	L
GW Level (post sample):	m bgl
Total Volume Purged:	L
Equipment:	

Water Quality Parameters

Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	***0.1° C***	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10%**	**+/- 10 mV**
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):		m bgl,	
Sample Appearance (e.g. colour, siltiness, odour):			
Sample ID:			
QA/QC Samples:			
Sampling Containers and filtration:			
Comments / Observations:			

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Groundwater Field Sheet

Project and Bore Installation Details

Bore / Standpipe ID:	102
Project Name:	
Project Number:	86884.02
Site Location:	Lee St, Haymarket
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	

Bore Development Details

Date/Time:	19/3/21 8.30.
Purged By:	JB.
GW Level (pre-purge):	3.32 m bgl
Observed Well Depth:	7.02 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	90 L
Total Volume Purged:	16 (target: no drill mud, min 3 well vol. or dry) DRY.
GW Level (post-purge):	6.98 m bgl
Equipment:	Twister pump + Laiton // Water: cloudy grey, no sheen, no odour, slightly oily

Micropurge and Sampling Details

Date/Time:	
Sampled By:	
Weather Conditions:	
GW Level (pre-purge):	m bgl
Observed Well Depth:	m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	L
GW Level (post sample):	m bgl
Total Volume Purged:	L
Equipment:	

Water Quality Parameters

Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	**0.1° C**	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10%**	**+/- 10 mV**
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):		m bgl,	
Sample Appearance (e.g. colour, siltiness, odour):			
Sample ID:			
QA/QC Samples:			
Sampling Containers and filtration:			
Comments / Observations:			

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Groundwater Field Sheet

Project and Bore Installation Details	
Bore / Standpipe ID:	1002
Project Name:	
Project Number:	86884.02
Site Location:	Lee Street, Maynooth.
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	

Bore Development Details	
Date/Time:	19/3/21 7.00.
Purged By:	JB.
GW Level (pre-purge):	16.42 m bgl
Observed Well Depth:	18.00 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	4.5 L
Total Volume Purged:	18 (target: no drill mud, min 3 well vol. or dry)
GW Level (post-purge):	16.71 m bgl
Equipment:	Twister pump; water: pale brown, low turbidity, no sheen, no odour.

Micropurge and Sampling Details	
Date/Time:	
Sampled By:	
Weather Conditions:	
GW Level (pre-purge):	m bgl
Observed Well Depth:	m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	L
GW Level (post sample):	m bgl
Total Volume Purged:	L
Equipment:	

Water Quality Parameters

Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	**0.1° C**	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10%**	**+/- 10 mV**
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):		m bgl,	
Sample Appearance (e.g. colour, siltiness, odour):			
Sample ID:			
QA/QC Samples:			
Sampling Containers and filtration:			
Comments / Observations:			

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Groundwater Field Sheet

Project and Bore Installation Details	
Bore / Standpipe ID:	1003A.
Project Name:	
Project Number:	
Site Location:	
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	
Bore Development Details	
Date/Time:	19/3/2021 11:00 AM
Purged By:	JB.
GW Level (pre-purge):	2.79. m bgl
Observed Well Depth:	3.93- m bgl [redacted]
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	3. L
Total Volume Purged:	25 (target: no drill mud, min 3 well vol. or dry)
GW Level (post-purge):	2.85 m bgl
Equipment:	Twister pump // Water : 0-10L: brown, silty. 10-25L: translucent, pale brown - no odour or sheen
Micropurge and Sampling Details	
Date/Time:	
Sampled By:	
Weather Conditions:	
GW Level (pre-purge):	m bgl
Observed Well Depth:	m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	L
GW Level (post sample):	m bgl
Total Volume Purged:	L
Equipment:	

Water Quality Parameters

Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	**0.1° C**	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10%**	**+/- 10 mV**
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):		m bgl,	
Sample Appearance (e.g. colour, siltiness, odour):			
Sample ID:			
QA/QC Samples:			
Sampling Containers and filtration:			
Comments / Observations:			

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Groundwater Field Sheet

Project and Bore Installation Details

Bore / Standpipe ID:	1007
Project Name:	
Project Number:	86584.02
Site Location:	Lee St, Hoyanchet
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	

Bore Development Details

Date/Time:	19/3/2021 11:30
Purged By:	
GW Level (pre-purge):	9.22 m bgl
Observed Well Depth:	14.40 m bgl depth measured at 15.31 post development
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	15 L
Total Volume Purged:	95 (target: no drill mud, min 3 well vol. or dry)
GW Level (post-purge):	15.21 m bgl
Equipment:	Twister pump // Water: brown, silty, no odour, no sheen. * SOL+: semi-translucent, low silty.

Micropurge and Sampling Details

Date/Time:	
Sampled By:	
Weather Conditions:	
GW Level (pre-purge):	m bgl
Observed Well Depth:	m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	L
GW Level (post sample):	m bgl
Total Volume Purged:	L
Equipment:	

Water Quality Parameters

Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	***0.1° C***	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10%**	**+/- 10 mV**

Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):		m bgl,	
Sample Appearance (e.g. colour, siltiness, odour):			
Sample ID:			
QA/QC Samples:			
Sampling Containers and filtration:			
Comments / Observations:	* Sheen on top of water ponding inside gatic.		

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Groundwater Field Sheet

Project and Bore Installation Details

Bore / Standpipe ID:	107A
Project Name:	
Project Number:	
Site Location:	
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	

Bore Development Details

Date/Time:	19/3/21 1:00
Purged By:	JB.
GW Level (pre-purge):	1.86 m bgl
Observed Well Depth:	3.76 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	5 / 7 L
Total Volume Purged:	(target: no drill mud, min 3 well vol. or dry) DRY (x2).
GW Level (post-purge):	3.73 m bgl
Equipment:	Twister pump + bailer // Water: clear, no sheen, no odour.

Micropurge and Sampling Details

Date/Time:	22/3/21 1:30 pm
Sampled By:	JB
Weather Conditions:	Rainy.
GW Level (pre-purge):	1.63 m bgl
Observed Well Depth:	3.76 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	6 L
GW Level (post sample):	3.75 m bgl (DRY)
Total Volume Purged:	7 L
Equipment:	Peristaltic pump, Bailer.

Water Quality Parameters

Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	**0.1° C**	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10%**	**+/- 10 mV**
1:35 // 0.5	21.9	3.71	463	6.06	995	109
1:36 // 1.0	21.8	3.59	436	6.18	205	84
1:37 // 1.5	21.7	3.50	441	6.22	257	67
1:38 // 2.0	21.7	3.47	422	6.25	232	71
1:39 // 2.5	21.7	3.44	41.6	6.26	260	64.
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):	3.0 m bgl,
Sample Appearance (e.g. colour, siltiness, odour):	clear / yellow. no silt, no odour, no sheen
Sample ID:	107A.
QA/QC Samples:	none.
Sampling Containers and filtration:	
Comments / Observations:	

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Groundwater Field Sheet

Project and Bore Installation Details

Bore / Standpipe ID:	107 B R
Project Name:	
Project Number:	
Site Location:	
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	

Bore Development Details

Date/Time:	19/3/2021 1:30
Purged By:	JB
GW Level (pre-purge):	2.16 m bgl
Observed Well Depth:	10.90 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	25 L
Total Volume Purged:	50 (target: no drill mud, min 3 well vol. or dry) DRY (x2)
GW Level (post-purge):	10.88 m bgl
Equipment:	Twister pump // Water: dark grey, semi-translucent, sulphurous odour, no sheen.

Micropurge and Sampling Details

Date/Time:	22/5/21 2:30
Sampled By:	JB
Weather Conditions:	Rainy.
GW Level (pre-purge):	1.85 m bgl
Observed Well Depth:	10.90 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	25 L
GW Level (post sample):	4.88 m bgl
Total Volume Purged:	8 L
Equipment:	Bailer, peristaltic pump.

Water Quality Parameters

Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	*0.1° C*	+/- 0.3 mg/L	+/- 3%	+/- 0.1	+/- 10%	+/- 10 mV
2:30 // 0.5	21.4	3.38	339	6.13	862	50.7
2:31 // 1.0	21.6	3.71	331	6.22	660	45.8
2:32 // 1.5	21.6	3.66	329	6.29	501	27.5
2:33 // 2.0	21.5	5.61	581.7	6.27	610	31.5
2:34 // 2.5	21.5	3.58	584.1	6.26	594	33.6

Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):	9.0	m bgl,
Sample Appearance (e.g. colour, siltiness, odour):	grey, semi-translucent, no odour, no sheen, low silt/grav.	
Sample ID:	107B.	
QA/QC Samples:	None.	
Sampling Containers and filtration:		
Comments / Observations:		

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Groundwater Field Sheet

Project and Bore Installation Details

Bore / Standpipe ID:	202
Project Name:	
Project Number:	86884.02
Site Location:	Lee St, Haymarket
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	

Bore Development Details

Date/Time:	19/3/21 8.30.
Purged By:	JB.
GW Level (pre-purge):	3.32 m bgl
Observed Well Depth:	7.02 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	10 L
Total Volume Purged:	16 (target: no drill mud, min 3 well vol. or dry) DRY.
GW Level (post-purge):	6.98 m bgl
Equipment:	Twister pump + bailer // water: cloudy grey, no sheen, no odour, slightly silty

Micropurge and Sampling Details

Date/Time:	22/3/21 5:20 pm
Sampled By:	JB
Weather Conditions:	Raining.
GW Level (pre-purge):	2.97 m bgl
Observed Well Depth:	7.02 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	11 L
GW Level (post sample):	6.90 m bgl
Total Volume Purged:	7 L
Equipment:	Peristaltic pump + bailer.

Water Quality Parameters

Time / Volume (L).	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	**0.1° C**	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10%**	**+/- 10 mV**
5:10 // 0.5	22.8	4.64	202	5.29	879	113
5:11 // 1.0	21.0	4.28	171	5.51	590	77
5:12 // 1.5	21.0	3.65	183	5.62	531	56
5:13 // 2.0	21.0	3.58	181	5.65	488	51
5:14 // 2.5	21.0	3.50	178	5.66	489	50

Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):	6.0 m bgl,
Sample Appearance (e.g. colour, siltiness, odour):	pale brown/translucent, low siltiness, no odour, no sheen.
Sample ID:	202
QA/QC Samples:	
Sampling Containers and filtration:	
Comments / Observations:	Rising head test performed

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Groundwater Field Sheet

Project and Bore Installation Details

Bore / Standpipe ID:	1002
Project Name:	
Project Number:	86884.02
Site Location:	Lee Street, Haymarket.
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	

Bore Development Details

Date/Time:	19/3/21 7.00.
Purged By:	JB.
GW Level (pre-purge):	16.42 m bgl
Observed Well Depth:	18.00 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	4.5 L
Total Volume Purged:	18 (target: no drill mud, min 3 well vol. or dry)
GW Level (post-purge):	16.71 m bgl
Equipment:	Twister pump; water: pale brown, low turbidity, no sheen, no odour.

Micropurge and Sampling Details

Date/Time:	22/3/21 12:00pm Rainy.
Sampled By:	JB.
Weather Conditions:	Rainy.
GW Level (pre-purge):	16.27 m bgl
Observed Well Depth:	18.00 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	5 L
GW Level (post sample):	16.36 m bgl
Total Volume Purged:	6 L
Equipment:	Peristaltic pump (DP513) + Bailer.

Water Quality Parameters

Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	*0.1° C*	+/- 0.3 mg/L	+/- 3%	+/- 0.1	+/- 10%	+/- 10 mV
12.00 / 0.5	21.1	3.94	410.8	5.54	537	135
12.01 / 1.0	21.2	3.38	341.5	5.64	614	121
12.02 / 1.5	21.2	3.37	342.3	5.71	577	109
12.03 / 2.0	21.2	3.10	348.9	5.79	532	105
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):	17.00 m bgl.
Sample Appearance (e.g. colour, siltiness, odour):	pale brown, low siltyness, no odour, no sheen.
Sample ID:	1002
QA/QC Samples:	BD1/20210321
Sampling Containers and filtration:	
Comments / Observations:	22/3/21: water: semi-translucent, pale brown, no sheen, no odour.

EC is in µS/cm.

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Groundwater Field Sheet

Project and Bore Installation Details

Bore / Standpipe ID:	1003A.
Project Name:	
Project Number:	
Site Location:	
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	

Bore Development Details

Date/Time:	19/3/2021 11:00 AM
Purged By:	JB
GW Level (pre-purge):	2.79 m bgl
Observed Well Depth:	3.93 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	6 L
Total Volume Purged:	30 (target: no drill mud, min 3 well vol. or dry)
GW Level (post-purge):	2.85 m bgl
Equipment:	Twister pump // Water : 0-10L : brown, silty. 10-25L : translucent, pale brown. no odour or sheen.

Micropurge and Sampling Details

Date/Time:	22/3/21 3:00
Sampled By:	JB
Weather Conditions:	Raining
GW Level (pre-purge):	2.78 m bgl
Observed Well Depth:	3.93 m bgl 3.93
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	6 L
GW Level (post sample):	2.81 m bgl
Total Volume Purged:	10 L
Equipment:	Peristaltic pump + Lailer **

Water Quality Parameters

Time / Volume (L)	Temp (°C)	DO (mg/L)	EC (~~µS or mS/cm~~) µS/cm.	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	*0.1° C*	+/- 0.3 mg/L	+/- 3%	+/- 0.1	+/- 10%	+/- 10 mV
3:10 / 0.5	22.0	3.75	232	5.96	636	128
3:11 / 1.0	22.1	4.21	232	6.19	647	102
3:12 / 1.5	22.1	4.28	233	6.35	721	88
3:13 / 2.0	22.1	4.33	237	6.57	706	78
3:14 / 2.5	22.1	4.36	241	6.35	712	74
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):	3.5 m bgl,
Sample Appearance (e.g. colour, siltiness, odour):	brown, silty, no sheen, no odour.
Sample ID:	1003A.
QA/QC Samples:	
Sampling Containers and filtration:	
Comments / Observations:	** additional 20L pumped out using twister pump for rising head test.

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Groundwater Field Sheet

Project and Bore Installation Details

Bore / Standpipe ID:	1007
Project Name:	
Project Number:	86584.02
Site Location:	Lee St, Haymarket
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	

Bore Development Details

Date/Time:	19/3/2021 11:30
Purged By:	
GW Level (pre-purge):	9.22 m bgl
Observed Well Depth:	14.40 m bgl depth measured at 15.81 post development
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	15 L
Total Volume Purged:	95 (target: no drill mud, min 3 well vol. or dry)
GW Level (post-purge):	15.21 m bgl
Equipment:	Twister pump // Water: brown, silty, no odour, no sheen. * 80L+: semi-translucent, very silty.

Micropurge and Sampling Details

Date/Time:	22/3/2021 4:00
Sampled By:	JB
Weather Conditions:	Raining
GW Level (pre-purge):	9.30 m bgl
Observed Well Depth:	15.81 m bgl (15.87m post purge).
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Estimated Bore Volume:	20 L
GW Level (post sample):	13.71 m bgl
Total Volume Purged:	10 L
Equipment:	Peristaltic pump + Lailer. **

Water Quality Parameters (EC in µS/cm.)

Time / Volume	Temp (°C)	DO (mg/L)	EC (~~µS or mS/m~~)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	**0.1° C**	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10%**	**+/- 10 mV**
0.5	20.3	4.35	524	6.07	2524	122.6
1.0	20.6	4.26	445	6.12	1566	87.4
1.5	20.7	3.28	477	6.11	1204	83.2
2.0	20.7	3.17	451	6.13	981	78.9
2.5	20.7	3.21	462	6.15	970	76.0
3.0	20.7	3.20	467	6.17	946	77.1
3.5	20.7	3.23	461	6.15	941	78.2

Additional Readings Following stabilisation:	DO % Sat	SPC	TDS

Sample Details

Sampling Depth (rationale):	15.0 m bgl,
Sample Appearance (e.g. colour, siltiness, odour):	brown, silty, no odour, no sheen
Sample ID:	1007,
QA/QC Samples:	
Sampling Containers and filtration:	
Comments / Observations:	* Sheen on top of water ponding inside gate. ** Twister pump used to pump ~120L post sampling for rising head test

Calibration & Service Report
Gas Monitor

Company:	Active Environmental Solutions Hire	**Manufacturer:**	RAE Systems	**Serial #:**	592-915472
Contact:	Aleks Todorovic	**Instrument:**	MiniRAE 3000	**Asset #:**	-
Address:	2 Merchant Avenue	**Model:**	PGM 7320	**Part #:**	-
	Thomastown Vic 3074	**Configuration:**	VOC	**Sold:**	-
Phone:	03 9464 2300 | **Fax**: 03 9464 3421	**Wireless:**	-	**Last Cal:**	-
Email:	hire@aesolutions.com.au	**Network ID:**	-	**Job #:**	-
		Unit ID:	-	**Cal Spec:**	Std

Item	Test	Pass/Fail	Comments
Battery	Li Ion	✓	
Charger	Charger, Power supply	✓	
	Cradle	✓	
Pump	Flow	✓	>500 mL/min
Filter	Filter, fitting, etc	✓	
Alarms	Audible, visual, vibration	✓	
Display	Operation	✓	
PCB	Operation	✓	
Connectors	Condition	✓	
Firmware	Version	✓	2.16
Datalogger	Operation	✓	
Monitor Housing	Condition	✓	
Case	Condition/Type	✓	
Sensors			
Oxygen		-	
LEL		-	
PID	10.6eV	✓	
Toxic 1		-	
Toxic 2		-	
Toxic 3		-	
Toxic 4		-	
Toxic 5		-	

Engineer's Report

Setup, Service and Calibration for Hire

Calibration Certificate

Sensor	Type	Serial No:	Span Gas	Concentration	Traceability Lot #	CF	Reading	
							Zero	Span
Oxygen								
LEL								
PID	10.6eV	1062R124396	Isobutylene	100 PPM	WO249617-27	1	0	100
Toxic 1								
Toxic 2								
Toxic 3								
Toxic 4								
Toxic 5								

Calibrated/Repaired by: Milenko Sisic

Date: 08/03/2021

Next due: 08/09/2021

Calibration & Service Report
Water Quality Meter

Company:	Active Environmental Solutions Hire	**Manufacturer:**	YSI	**Serial #:**	18H111016
Address:	Unit 16, 191 Parramatta Road AUBURN NSW 2144	**Instrument/Model:**	ProDSS Handheld Water Quality Meter	**Cable Length:**	1 M
Phone:	02 9716 5966 | **Fax**: 02 9716 5988	**Client Company:**		**Client Email:**	
Email:	hire@aesoultions.com.au	**Client Name:**		**Client Phone:**	

Item	Test	Pass	Comments
Battery	Charged	✓	
	Battery Saver	✓	Automatically turns off after 15 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	1.1.8
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	
pH slope		✓	
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	Variance range ± 20mV
Conductivity			
Condition		✓	Good, clean
Calibrated and conforms to manufacturer's specifications		✓	°C
Turbidity			
Calibrated and conforms to manufacturer's specifications		✓	
Condition		✓	
Dissolved Oxygen			
Condition		✓	Good, clean
Calibrated and conforms to manufacturer's specifications		✓	

Parameter	Standards	Reference	Calibration Point	Before	After	Units
Temperature	Center 370 Thermometer	Room Temp.	22.8	N/A	22.8	°C
pH	pH 4.00	349389	4.01	3.84	4.01	pH
pH	pH 10.00	344906	10.00	9.99	10.00	pH
pH	pH 7.00	349958	7.00	7.00	7.00	pH
Conductivity	2760 µs/cm at 25°C	354236	2760	2790	2760	µs/cm
ORP (Ref. check only)	Zobell A & B	340526 & 340529	234.1	232.1	234.1	mV
Zero Dissolved Oxygen	NaSO3 in distilled water	283762; V070819	0.0	0.9	0.0	%
100% Dissolved Oxygen	100% Air Saturation	Fresh Air	100.6	97.5	100.6	%
Zero Turbidity	0 FNU	W-54320-V070819	0.00	-0.50	0.00	FNU
Turbidity	124.00 FNU	20H20290164	124.00	123.79	124.00	FNU

Calibrated By: Milenko Sisic

Calibration Date: 16/02/2021 **Calibration Due:** 16/08/2021

Appendix I

Chain of Custody, Sample Receipt Advice

and Certificate of Analysis Documentation

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 264169

Client Details

Client	Douglas Partners Pty Ltd
Attention	David Holden, Alyssa Spencer
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**86884.02, Haymarket**
Number of Samples	12 Soil
Date samples received	12/03/2021
Date completed instructions received	12/03/2021

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	19/03/2021
Date of Issue	19/03/2021

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Asbestos Approved By
Analysed by Asbestos Approved Identifier: Lucy Zhu, Panika Wongchanda
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Diego Bigolin, Team Leader, Inorganics
Dragana Tomas, Senior Chemist
Ken Nguyen, Reporting Supervisor
Loren Bardwell, Senior Chemist
Lucy Zhu, Asbestos Supervisor
Manju Dewendrage, Chemist
Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

VOCs in soil					
Our Reference		264169-1	264169-2	264169-5	264169-9
Your Reference	UNITS	BH1003/0.25-0.3	BH1003A/0.8-0.9	BH1004/0.6-0.7	BH1007/0.2-0.3
Date Sampled		10/03/2021	10/03/2021	11/03/2021	11/03/2021
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	15/03/2021	15/03/2021	15/03/2021	15/03/2021
Date analysed	-	17/03/2021	17/03/2021	17/03/2021	17/03/2021
Dichlorodifluoromethane	mg/kg	<1	<1	<1	<1
Chloromethane	mg/kg	<1	<1	<1	<1
Vinyl Chloride	mg/kg	<1	<1	<1	<1
Bromomethane	mg/kg	<1	<1	<1	<1
Chloroethane	mg/kg	<1	<1	<1	<1
Trichlorofluoromethane	mg/kg	<1	<1	<1	<1
1,1-Dichloroethene	mg/kg	<1	<1	<1	<1
trans-1,2-dichloroethene	mg/kg	<1	<1	<1	<1
1,1-dichloroethane	mg/kg	<1	<1	<1	<1
cis-1,2-dichloroethene	mg/kg	<1	<1	<1	<1
bromochloromethane	mg/kg	<1	<1	<1	<1
chloroform	mg/kg	<1	<1	<1	<1
2,2-dichloropropane	mg/kg	<1	<1	<1	<1
1,2-dichloroethane	mg/kg	<1	<1	<1	<1
1,1,1-trichloroethane	mg/kg	<1	<1	<1	<1
1,1-dichloropropene	mg/kg	<1	<1	<1	<1
Cyclohexane	mg/kg	<1	<1	<1	<1
carbon tetrachloride	mg/kg	<1	<1	<1	<1
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2
dibromomethane	mg/kg	<1	<1	<1	<1
1,2-dichloropropane	mg/kg	<1	<1	<1	<1
trichloroethene	mg/kg	<1	<1	<1	<1
bromodichloromethane	mg/kg	<1	<1	<1	<1
trans-1,3-dichloropropene	mg/kg	<1	<1	<1	<1
cis-1,3-dichloropropene	mg/kg	<1	<1	<1	<1
1,1,2-trichloroethane	mg/kg	<1	<1	<1	<1
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5
1,3-dichloropropane	mg/kg	<1	<1	<1	<1
dibromochloromethane	mg/kg	<1	<1	<1	<1
1,2-dibromoethane	mg/kg	<1	<1	<1	<1
tetrachloroethene	mg/kg	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	mg/kg	<1	<1	<1	<1
chlorobenzene	mg/kg	<1	<1	<1	<1
Ethylbenzene	mg/kg	<1	<1	<1	<1

VOCs in soil					
Our Reference		264169-1	264169-2	264169-5	264169-9
Your Reference	UNITS	BH1003/0.25-0.3	BH1003A/0.8-0.9	BH1004/0.6-0.7	BH1007/0.2-0.3
Date Sampled		10/03/2021	10/03/2021	11/03/2021	11/03/2021
Type of sample		Soil	Soil	Soil	Soil
bromoform	mg/kg	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2
styrene	mg/kg	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	mg/kg	<1	<1	<1	<1
o-Xylene	mg/kg	<1	<1	<1	<1
1,2,3-trichloropropane	mg/kg	<1	<1	<1	<1
isopropylbenzene	mg/kg	<1	<1	<1	<1
bromobenzene	mg/kg	<1	<1	<1	<1
n-propyl benzene	mg/kg	<1	<1	<1	<1
2-chlorotoluene	mg/kg	<1	<1	<1	<1
4-chlorotoluene	mg/kg	<1	<1	<1	<1
1,3,5-trimethyl benzene	mg/kg	<1	<1	<1	<1
tert-butyl benzene	mg/kg	<1	<1	<1	<1
1,2,4-trimethyl benzene	mg/kg	<1	<1	<1	<1
1,3-dichlorobenzene	mg/kg	<1	<1	<1	<1
sec-butyl benzene	mg/kg	<1	<1	<1	<1
1,4-dichlorobenzene	mg/kg	<1	<1	<1	<1
4-isopropyl toluene	mg/kg	<1	<1	<1	<1
1,2-dichlorobenzene	mg/kg	<1	<1	<1	<1
n-butyl benzene	mg/kg	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	mg/kg	<1	<1	<1	<1
1,2,4-trichlorobenzene	mg/kg	<1	<1	<1	<1
hexachlorobutadiene	mg/kg	<1	<1	<1	<1
1,2,3-trichlorobenzene	mg/kg	<1	<1	<1	<1
Surrogate Dibromofluorometha	%	108	90	112	106
Surrogate aaa-Trifluorotoluene	%	134	116	135	128
Surrogate Toluene-d_8	%	113	102	118	114
Surrogate 4-Bromofluorobenzene	%	97	95	100	97

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		264169-1	264169-2	264169-3	264169-4	264169-5
Your Reference	UNITS	BH1003/0.25-0.3	BH1003A/0.8-0.9	BH1003A/1.9-2.0	BH1004/0.3-0.4	BH1004/0.6-0.7
Date Sampled		10/03/2021	10/03/2021	10/03/2021	11/03/2021	11/03/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/03/2021	15/03/2021	15/03/2021	15/03/2021	15/03/2021
Date analysed	-	17/03/2021	17/03/2021	17/03/2021	17/03/2021	17/03/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	134	116	115	103	135

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		264169-6	264169-7	264169-8	264169-9	264169-10
Your Reference	UNITS	BH1005/0.22-0.3	BH1005/0.5-0.6	BH1005/1.55-1.65	BH1007/0.2-0.3	BD3/100321
Date Sampled		11/03/2021	11/03/2021	11/03/2021	11/03/2021	10/03/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/03/2021	15/03/2021	15/03/2021	15/03/2021	15/03/2021
Date analysed	-	17/03/2021	17/03/2021	17/03/2021	17/03/2021	17/03/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	9	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	103	108	95	128	87

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		264169-11	264169-12
Your Reference	UNITS	TS	TB
Date Sampled		-	-
Type of sample		Soil	Soil
Date extracted	-	15/03/2021	15/03/2021
Date analysed	-	17/03/2021	17/03/2021
Benzene	mg/kg	93%	<0.2
Toluene	mg/kg	98%	<0.5
Ethylbenzene	mg/kg	101%	<1
m+p-xylene	mg/kg	101%	<2
o-Xylene	mg/kg	101%	<1
Total +ve Xylenes	mg/kg	[NA]	<3
Surrogate aaa-Trifluorotoluene	%	99	110

svTRH (C10-C40) in Soil						
Our Reference		264169-1	264169-2	264169-3	264169-4	264169-5
Your Reference	UNITS	BH1003/0.25-0.3	BH1003A/0.8-0.9	BH1003A/1.9-2.0	BH1004/0.3-0.4	BH1004/0.6-0.7
Date Sampled		10/03/2021	10/03/2021	10/03/2021	11/03/2021	11/03/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/03/2021	15/03/2021	15/03/2021	15/03/2021	15/03/2021
Date analysed	-	15/03/2021	15/03/2021	15/03/2021	15/03/2021	16/03/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	120	<100	<100	110	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	170	<100	<100	170	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	170	<50	<50	170	<50
Surrogate o-Terphenyl	%	109	89	86	96	91

svTRH (C10-C40) in Soil						
Our Reference		264169-6	264169-7	264169-8	264169-9	264169-10
Your Reference	UNITS	BH1005/0.22-0.3	BH1005/0.5-0.6	BH1005/1.55-1.65	BH1007/0.2-0.3	BD3/100321
Date Sampled		11/03/2021	11/03/2021	11/03/2021	11/03/2021	10/03/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/03/2021	15/03/2021	15/03/2021	15/03/2021	15/03/2021
Date analysed	-	16/03/2021	16/03/2021	16/03/2021	16/03/2021	16/03/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	120	240	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	100	120	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	200	320	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	200	320	<50	<50
Surrogate o-Terphenyl	%	88	96	107	90	83

PAHs in Soil						
Our Reference		264169-1	264169-2	264169-3	264169-4	264169-5
Your Reference	UNITS	BH1003/0.25-0.3	BH1003A/0.8-0.9	BH1003A/1.9-2.0	BH1004/0.3-0.4	BH1004/0.6-0.7
Date Sampled		10/03/2021	10/03/2021	10/03/2021	11/03/2021	11/03/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/03/2021	15/03/2021	15/03/2021	15/03/2021	15/03/2021
Date analysed	-	16/03/2021	16/03/2021	16/03/2021	16/03/2021	16/03/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1	0.3	<0.1
Acenaphthylene	mg/kg	0.2	0.2	<0.1	0.6	0.3
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	0.3	0.2
Phenanthrene	mg/kg	0.5	0.7	<0.1	2.9	2.0
Anthracene	mg/kg	0.2	0.2	<0.1	1.3	0.5
Fluoranthene	mg/kg	1.6	1.6	<0.1	5.6	2.6
Pyrene	mg/kg	1.7	1.5	<0.1	6.0	2.6
Benzo(a)anthracene	mg/kg	1.2	1.1	<0.1	3.3	1.5
Chrysene	mg/kg	0.8	0.8	<0.1	2.9	1.2
Benzo(b,j+k)fluoranthene	mg/kg	1	1	<0.2	4.2	2
Benzo(a)pyrene	mg/kg	0.94	0.73	<0.05	2.9	1.2
Indeno(1,2,3-c,d)pyrene	mg/kg	0.4	0.4	<0.1	1.1	0.5
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	0.4	0.2
Benzo(g,h,i)perylene	mg/kg	0.5	0.3	<0.1	2.0	0.6
Total +ve PAH's	mg/kg	9.3	8.9	<0.05	34	15
Benzo(a)pyrene TEQ calc (zero)	mg/kg	1.2	1.0	<0.5	4.2	1.8
Benzo(a)pyrene TEQ calc(half)	mg/kg	1.3	1.1	<0.5	4.2	1.8
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	1.3	1.1	<0.5	4.2	1.8
Surrogate p-Terphenyl-d14	%	104	106	117	105	109

PAHs in Soil						
Our Reference		264169-6	264169-7	264169-8	264169-9	264169-10
Your Reference	UNITS	BH1005/0.22-0.3	BH1005/0.5-0.6	BH1005/1.55-1.65	BH1007/0.2-0.3	BD3/100321
Date Sampled		11/03/2021	11/03/2021	11/03/2021	11/03/2021	10/03/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/03/2021	15/03/2021	15/03/2021	15/03/2021	15/03/2021
Date analysed	-	16/03/2021	16/03/2021	16/03/2021	16/03/2021	16/03/2021
Naphthalene	mg/kg	<0.1	0.3	8.3	<0.1	<0.1
Acenaphthylene	mg/kg	0.2	0.5	1.9	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	0.1	2.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	0.4	4.1	<0.1	<0.1
Phenanthrene	mg/kg	0.5	3.6	35	0.1	<0.1
Anthracene	mg/kg	0.2	1.3	12	<0.1	<0.1
Fluoranthene	mg/kg	1.7	5.8	27	0.4	<0.1
Pyrene	mg/kg	1.9	5.6	25	0.5	<0.1
Benzo(a)anthracene	mg/kg	1.3	3.6	11	0.4	<0.1
Chrysene	mg/kg	1	2.7	9.5	0.2	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	2	3.8	11	0.5	<0.2
Benzo(a)pyrene	mg/kg	1.2	2.7	8.4	0.3	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	0.6	0.9	3.8	0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	0.2	0.3	1.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.7	1.8	4.5	0.2	<0.1
Total +ve PAH's	mg/kg	11	33	160	2.7	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	1.8	3.9	12	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	1.8	3.9	12	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	1.8	3.9	12	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	110	104	108	116	116

Organochlorine Pesticides in soil						
Our Reference		264169-1	264169-2	264169-4	264169-7	264169-9
Your Reference	UNITS	BH1003/0.25-0.3	BH1003A/0.8-0.9	BH1004/0.3-0.4	BH1005/0.5-0.6	BH1007/0.2-0.3
Date Sampled		10/03/2021	10/03/2021	11/03/2021	11/03/2021	11/03/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/03/2021	15/03/2021	15/03/2021	15/03/2021	15/03/2021
Date analysed	-	16/03/2021	16/03/2021	16/03/2021	16/03/2021	16/03/2021
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	105	105	110	106	104

Organophosphorus Pesticides in Soil						
Our Reference		264169-1	264169-2	264169-4	264169-7	264169-9
Your Reference	UNITS	BH1003/0.25-0.3	BH1003A/0.8-0.9	BH1004/0.3-0.4	BH1005/0.5-0.6	BH1007/0.2-0.3
Date Sampled		10/03/2021	10/03/2021	11/03/2021	11/03/2021	11/03/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/03/2021	15/03/2021	15/03/2021	15/03/2021	15/03/2021
Date analysed	-	16/03/2021	16/03/2021	16/03/2021	16/03/2021	16/03/2021
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	105	105	110	106	104

PCBs in Soil						
Our Reference		264169-1	264169-2	264169-4	264169-7	264169-9
Your Reference	UNITS	BH1003/0.25-0.3	BH1003A/0.8-0.9	BH1004/0.3-0.4	BH1005/0.5-0.6	BH1007/0.2-0.3
Date Sampled		10/03/2021	10/03/2021	11/03/2021	11/03/2021	11/03/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/03/2021	15/03/2021	15/03/2021	15/03/2021	15/03/2021
Date analysed	-	16/03/2021	16/03/2021	16/03/2021	16/03/2021	16/03/2021
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	105	105	110	106	104

Acid Extractable metals in soil						
Our Reference		264169-1	264169-2	264169-3	264169-4	264169-5
Your Reference	UNITS	BH1003/0.25-0.3	BH1003A/0.8-0.9	BH1003A/1.9-2.0	BH1004/0.3-0.4	BH1004/0.6-0.7
Date Sampled		10/03/2021	10/03/2021	10/03/2021	11/03/2021	11/03/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/03/2021	15/03/2021	15/03/2021	15/03/2021	15/03/2021
Date analysed	-	16/03/2021	16/03/2021	16/03/2021	16/03/2021	16/03/2021
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	6	7	<1	8	6
Copper	mg/kg	17	8	<1	37	12
Lead	mg/kg	40	32	1	72	75
Mercury	mg/kg	0.2	0.2	<0.1	0.5	0.3
Nickel	mg/kg	4	2	<1	6	3
Zinc	mg/kg	37	35	4	82	38

Acid Extractable metals in soil						
Our Reference		264169-6	264169-7	264169-8	264169-9	264169-10
Your Reference	UNITS	BH1005/0.22-0.3	BH1005/0.5-0.6	BH1005/1.55-1.65	BH1007/0.2-0.3	BD3/100321
Date Sampled		11/03/2021	11/03/2021	11/03/2021	11/03/2021	10/03/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/03/2021	15/03/2021	15/03/2021	15/03/2021	15/03/2021
Date analysed	-	16/03/2021	16/03/2021	16/03/2021	16/03/2021	16/03/2021
Arsenic	mg/kg	<4	5	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	7	8	9	9	<1
Copper	mg/kg	29	27	37	24	2
Lead	mg/kg	59	66	210	53	8
Mercury	mg/kg	0.3	0.3	0.7	0.3	<0.1
Nickel	mg/kg	6	4	6	7	<1
Zinc	mg/kg	68	74	150	50	4

Misc Soil - Inorg						
Our Reference		264169-1	264169-2	264169-4	264169-7	264169-9
Your Reference	UNITS	BH1003/0.25-0.3	BH1003A/0.8-0.9	BH1004/0.3-0.4	BH1005/0.5-0.6	BH1007/0.2-0.3
Date Sampled		10/03/2021	10/03/2021	11/03/2021	11/03/2021	11/03/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/03/2021	15/03/2021	15/03/2021	15/03/2021	15/03/2021
Date analysed	-	15/03/2021	15/03/2021	15/03/2021	15/03/2021	15/03/2021
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Moisture						
Our Reference		264169-1	264169-2	264169-3	264169-4	264169-5
Your Reference	UNITS	BH1003/0.25-0.3	BH1003A/0.8-0.9	BH1003A/1.9-2.0	BH1004/0.3-0.4	BH1004/0.6-0.7
Date Sampled		10/03/2021	10/03/2021	10/03/2021	11/03/2021	11/03/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/03/2021	15/03/2021	15/03/2021	15/03/2021	15/03/2021
Date analysed	-	16/03/2021	16/03/2021	16/03/2021	16/03/2021	16/03/2021
Moisture	%	10	16	3.1	9.8	9.0

Moisture						
Our Reference		264169-6	264169-7	264169-8	264169-9	264169-10
Your Reference	UNITS	BH1005/0.22-0.3	BH1005/0.5-0.6	BH1005/1.55-1.65	BH1007/0.2-0.3	BD3/100321
Date Sampled		11/03/2021	11/03/2021	11/03/2021	11/03/2021	10/03/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/03/2021	15/03/2021	15/03/2021	15/03/2021	15/03/2021
Date analysed	-	16/03/2021	16/03/2021	16/03/2021	16/03/2021	16/03/2021
Moisture	%	15	11	15	18	8.1

Asbestos ID - soils						
Our Reference		264169-3	264169-4	264169-5	264169-6	264169-7
Your Reference	UNITS	BH1003A/1.9-2.0	BH1004/0.3-0.4	BH1004/0.6-0.7	BH1005/0.22-0.3	BH1005/0.5-0.6
Date Sampled		10/03/2021	11/03/2021	11/03/2021	11/03/2021	11/03/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	19/03/2021	19/03/2021	19/03/2021	19/03/2021	19/03/2021
Sample mass tested	g	Approx. 60g	Approx. 45g	Approx. 55g	Approx. 55g	Approx. 65g
Sample Description	-	White sandy soil	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Asbestos comments	-	NO	NO	NO	NO	NO
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils		
Our Reference		264169-8
Your Reference	UNITS	BH1005/1.55-1.65
Date Sampled		11/03/2021
Type of sample		Soil
Date analysed	-	19/03/2021
Sample mass tested	g	Approx. 75g
Sample Description	-	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Asbestos comments	-	NO
Trace Analysis	-	No asbestos detected

Asbestos ID - soils NEPM				
Our Reference		264169-1	264169-2	264169-9
Your Reference	UNITS	BH1003/0.25-0.3	BH1003A/0.8-0.9	BH1007/0.2-0.3
Date Sampled		10/03/2021	10/03/2021	11/03/2021
Type of sample		Soil	Soil	Soil
Date analysed	-	17/03/2021	17/03/2021	17/03/2021
Sample mass tested	g	976.03	1,444.55	1,030.77
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–
FA and AF Estimation*	g	–	–	–
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001

Misc Inorg - Soil				
Our Reference		264169-2	264169-6	264169-8
Your Reference	UNITS	BH1003A/0.8-0.9	BH1005/0.22-0.3	BH1005/1.55-1.65
Date Sampled		10/03/2021	11/03/2021	11/03/2021
Type of sample		Soil	Soil	Soil
Date prepared	-	17/03/2021	17/03/2021	17/03/2021
Date analysed	-	17/03/2021	17/03/2021	17/03/2021
pH 1:5 soil:water	pH Units	8.9	9.3	9.5

CEC				
Our Reference		264169-2	264169-6	264169-8
Your Reference	UNITS	BH1003A/0.8-0.9	BH1005/0.22-0.3	BH1005/1.55-1.65
Date Sampled		10/03/2021	11/03/2021	11/03/2021
Type of sample		Soil	Soil	Soil
Date prepared	-	18/03/2021	18/03/2021	18/03/2021
Date analysed	-	18/03/2021	18/03/2021	18/03/2021
Exchangeable Ca	meq/100g	4.8	15	14
Exchangeable K	meq/100g	<0.1	0.2	0.2
Exchangeable Mg	meq/100g	0.22	0.29	0.15
Exchangeable Na	meq/100g	<0.1	<0.1	<0.1
Cation Exchange Capacity	meq/100g	5.1	15	15

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) **NOTE** #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.

Method ID	Methodology Summary
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: VOCs in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	264169-2
Date extracted	-			15/03/2021	1	15/03/2021	15/03/2021		15/03/2021	15/03/2021
Date analysed	-			17/03/2021	1	17/03/2021	17/03/2021		17/03/2021	17/03/2021
Dichlorodifluoromethane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chloromethane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Vinyl Chloride	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromomethane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chloroethane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trichlorofluoromethane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1-Dichloroethene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
trans-1,2-dichloroethene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	mg/kg	1	Org-023	<1	1	<1	<1	0	92	121
cis-1,2-dichloroethene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
bromochloromethane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
chloroform	mg/kg	1	Org-023	<1	1	<1	<1	0	101	118
2,2-dichloropropane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	mg/kg	1	Org-023	<1	1	<1	<1	0	86	105
1,1,1-trichloroethane	mg/kg	1	Org-023	<1	1	<1	<1	0	78	86
1,1-dichloropropene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Cyclohexane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
carbon tetrachloride	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
dibromomethane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
trichloroethene	mg/kg	1	Org-023	<1	1	<1	<1	0	65	71
bromodichloromethane	mg/kg	1	Org-023	<1	1	<1	<1	0	84	92
trans-1,3-dichloropropene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,3-dichloropropane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
dibromochloromethane	mg/kg	1	Org-023	<1	1	<1	<1	0	85	91
1,2-dibromoethane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
tetrachloroethene	mg/kg	1	Org-023	<1	1	<1	<1	0	90	100
1,1,1,2-tetrachloroethane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
chlorobenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
bromoform	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	[NT]	[NT]
styrene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VOCs in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	264169-2
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichloropropane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
isopropylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
bromobenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-propyl benzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
2-chlorotoluene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-chlorotoluene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
tert-butyl benzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
sec-butyl benzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-butyl benzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
hexachlorobutadiene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluorometha	%		Org-023	100	1	108	104	4	94	123
Surrogate aaa-Trifluorotoluene	%		Org-023	111	1	134	128	5	98	111
Surrogate Toluene-d_8	%		Org-023	108	1	113	114	1	100	119
Surrogate 4-Bromofluorobenzene	%		Org-023	96	1	97	96	1	95	99

QUALITY CONTROL: VOCs in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	9	15/03/2021	15/03/2021		[NT]	[NT]
Date analysed	-			[NT]	9	17/03/2021	17/03/2021		[NT]	[NT]
Dichlorodifluoromethane	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
Chloromethane	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
Vinyl Chloride	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
Bromomethane	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
Chloroethane	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
Trichlorofluoromethane	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
1,1-Dichloroethene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
trans-1,2-dichloroethene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
cis-1,2-dichloroethene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
bromochloromethane	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
chloroform	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
2,2-dichloropropane	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
1,1,1-trichloroethane	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
1,1-dichloropropene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
Cyclohexane	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
carbon tetrachloride	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	9	<0.2	<0.2	0	[NT]	[NT]
dibromomethane	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
trichloroethene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
bromodichloromethane	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
trans-1,3-dichloropropene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	9	<0.5	<0.5	0	[NT]	[NT]
1,3-dichloropropane	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
dibromochloromethane	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
1,2-dibromoethane	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
tetrachloroethene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
1,1,1,2-tetrachloroethane	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
chlorobenzene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
bromoform	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	9	<2	<2	0	[NT]	[NT]
styrene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VOCs in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
1,2,3-trichloropropane	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
isopropylbenzene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
bromobenzene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
n-propyl benzene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
2-chlorotoluene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
4-chlorotoluene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
tert-butyl benzene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
sec-butyl benzene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
n-butyl benzene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
hexachlorobutadiene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluorometha	%		Org-023	[NT]	9	106	91	15	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	9	128	107	18	[NT]	[NT]
Surrogate Toluene-d_8	%		Org-023	[NT]	9	114	103	10	[NT]	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	[NT]	9	97	96	1	[NT]	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	264169-2
Date extracted	-			15/03/2021	1	15/03/2021	15/03/2021		15/03/2021	15/03/2021
Date analysed	-			17/03/2021	1	17/03/2021	17/03/2021		17/03/2021	17/03/2021
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	90	95
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	90	95
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	87	87
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	91	108
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	94	96
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	88	92
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	92	97
naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	111	1	134	128	5	98	111

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	9	15/03/2021	15/03/2021		[NT]	[NT]
Date analysed	-			[NT]	9	17/03/2021	17/03/2021		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	9	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	9	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	9	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	9	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	9	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-023	[NT]	9	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	9	128	107	18	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	264169-2
Date extracted	-			15/03/2021	1	15/03/2021	15/03/2021		15/03/2021	15/03/2021
Date analysed	-			16/03/2021	1	15/03/2021	15/03/2021		15/03/2021	15/03/2021
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	87	85
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	120	<100	18	86	91
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	70	78
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	87	85
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	170	<100	52	86	91
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	70	78
Surrogate o-Terphenyl	%		Org-020	89	1	109	89	20	86	90

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			[NT]	9	15/03/2021	15/03/2021		15/03/2021	[NT]
Date analysed	-			[NT]	9	16/03/2021	16/03/2021		16/03/2021	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	9	<50	<50	0	86	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	9	<100	<100	0	88	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	9	<100	<100	0	92	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	9	<50	<50	0	86	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	9	<100	<100	0	88	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	9	<100	<100	0	92	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	9	90	88	2	81	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	264169-2
Date extracted	-			15/03/2021	1	15/03/2021	15/03/2021		15/03/2021	15/03/2021
Date analysed	-			16/03/2021	1	16/03/2021	16/03/2021		16/03/2021	16/03/2021
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	99	92
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	1	0.2	0.2	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	103	94
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	111	112
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	0.5	1.2	82	117	78
Anthracene	mg/kg	0.1	Org-022/025	<0.1	1	0.2	0.4	67	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	1	1.6	1.8	12	109	#
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	1.7	2.0	16	109	#
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	1.2	1.4	15	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	1	0.8	0.9	12	106	84
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	1	1	2	67	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	1	0.94	1.0	6	112	80
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	1	0.4	0.4	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	1	0.5	0.5	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	109	1	104	98	6	99	105

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			[NT]	9	15/03/2021	15/03/2021		15/03/2021	[NT]
Date analysed	-			[NT]	9	16/03/2021	16/03/2021		16/03/2021	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	99	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	99	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	104	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	9	0.1	0.2	67	107	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	9	0.4	0.5	22	109	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	9	0.5	0.5	0	109	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	9	0.4	0.4	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	9	0.2	0.3	40	122	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	9	0.5	0.4	22	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	9	0.3	0.3	0	112	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	9	0.1	0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	9	0.2	0.1	67	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	9	116	128	10	112	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	264169-2
Date extracted	-			15/03/2021	1	15/03/2021	15/03/2021		15/03/2021	15/03/2021
Date analysed	-			16/03/2021	1	16/03/2021	16/03/2021		16/03/2021	16/03/2021
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	104	87
HCB	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	104	83
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	103	87
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	105	103
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	107	103
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	111	108
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	109	107
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	114	82
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	103	95
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	97	76
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	101	1	105	114	8	102	101

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			[NT]	9	15/03/2021	15/03/2021		15/03/2021	[NT]
Date analysed	-			[NT]	9	16/03/2021	16/03/2021		16/03/2021	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	104	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	102	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	105	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	112	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	110	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	113	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	113	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	104	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	106	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	109	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	9	104	109	5	110	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	264169-2
Date extracted	-			15/03/2021	1	15/03/2021	15/03/2021		15/03/2021	15/03/2021
Date analysed	-			16/03/2021	1	16/03/2021	16/03/2021		16/03/2021	16/03/2021
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	124	65
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	116	113
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	111	83
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	125	90
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	115	103
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	104	90
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	125	107
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	101	1	105	114	8	102	101

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			[NT]	9	15/03/2021	15/03/2021		15/03/2021	[NT]
Date analysed	-			[NT]	9	16/03/2021	16/03/2021		16/03/2021	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	92	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	124	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	91	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	133	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	113	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	90	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	107	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	9	104	109	5	110	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	264169-2
Date extracted	-			15/03/2021	1	15/03/2021	15/03/2021		15/03/2021	15/03/2021
Date analysed	-			16/03/2021	1	16/03/2021	16/03/2021		16/03/2021	16/03/2021
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	100	90
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	101	1	105	114	8	102	101

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			[NT]	9	15/03/2021	15/03/2021		15/03/2021	[NT]
Date analysed	-			[NT]	9	16/03/2021	16/03/2021		16/03/2021	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	[NT]	9	<0.1	<0.1	0	100	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	[NT]	9	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	9	104	109	5	110	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	264169-2
Date prepared	-			15/03/2021	1	15/03/2021	15/03/2021		15/03/2021	15/03/2021
Date analysed	-			16/03/2021	1	16/03/2021	16/03/2021		16/03/2021	16/03/2021
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	101	91
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	103	93
Chromium	mg/kg	1	Metals-020	<1	1	6	7	15	100	89
Copper	mg/kg	1	Metals-020	<1	1	17	13	27	97	96
Lead	mg/kg	1	Metals-020	<1	1	40	37	8	98	86
Mercury	mg/kg	0.1	Metals-021	<0.1	1	0.2	0.2	0	114	#
Nickel	mg/kg	1	Metals-020	<1	1	4	3	29	105	96
Zinc	mg/kg	1	Metals-020	<1	1	37	36	3	107	104

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	9	15/03/2021	15/03/2021		[NT]	[NT]
Date analysed	-			[NT]	9	16/03/2021	16/03/2021		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	9	<4	<4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	9	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	9	9	9	0	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	9	24	31	25	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	9	53	48	10	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	9	0.3	0.2	40	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	9	7	8	13	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	9	50	45	11	[NT]	[NT]

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	264169-2
Date prepared	-			15/03/2021	1	15/03/2021	15/03/2021		15/03/2021	15/03/2021
Date analysed	-			15/03/2021	1	15/03/2021	15/03/2021		15/03/2021	15/03/2021
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	1	<5	<5	0	100	99

QUALITY CONTROL: Misc Inorg - Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date prepared	-			17/03/2021	[NT]	[NT]	[NT]	[NT]	17/03/2021	[NT]
Date analysed	-			17/03/2021	[NT]	[NT]	[NT]	[NT]	17/03/2021	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	102	[NT]

QUALITY CONTROL: CEC					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			18/03/2021	[NT]	[NT]	[NT]	[NT]	18/03/2021	[NT]
Date analysed	-			18/03/2021	[NT]	[NT]	[NT]	[NT]	18/03/2021	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	119	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	119	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
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Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

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Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

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Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

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Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

PAHs in Soil - # Percent recovery for the matrix spike is not possible to report as the high concentration of analytes in sample 264169-2 has caused interference.

Asbestos-ID in soil: NEPM
This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

8 metals in soil - # Percent recovery is not possible to report due to the inhomogeneous nature of the element in the sample. However an acceptable recovery was obtained for the LCS.

Asbestos: A portion of the supplied samples were sub-sampled for asbestos
analysis according to Envirolab procedures.
We cannot guarantee that these sub-samples are indicative of the entire sample.
Envirolab recommends supplying 40-50g of sample in its own container.
Note: Samples 264169-3-8 were sub-sampled from jars provided by the client.

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	86884.02	**Suburb:**	Haymarket	**To:**	EnviroLab
Project Name:	Haymarket Contamination Assessment	**Order Number**			12 Ashley Street, Chatswood 2067
Project Manager:	David Holden	**Sampler:**	Alyssa Spencer	**Attn:**	Aileen Hie
Emails:	David.Holden@douglaspartners.com.au	Alyssa.Spencer@douglaspartners.com.au		**Phone:**	(02) 9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☒			**Email:**	Ahie@envirolab.com.au
Prior Storage:	☒ Esky ☒ Fridge ☐ Shelved	Do samples contain 'potential' HBM?	Yes ☒ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)		

Sample ID	Lab ID	Date Sampled	Sample Type (S - soil W - water)	Container Type (G - glass P - plastic)	Analytes: Combo 8A	Combo 3A	VOC	pH and CEC	Metal TCLP on hold	PAH TCLP on hold	Combo 3	500mL AF/FA	BTEX	Notes/preservation
BH1003/0.25-0.3	1	10/03/21			X		X					X		*aggressivity testing
BH1003A/0.8-0.9	2	10/03/21			X		X	X	X	X		X		
BH1003A/1.9-2.0	3	10/03/21				X								
BH1004/0.3-0.4	4	11/03/21			X									
BH1004/0.6-0.7	5	11/03/21				X	X							
BH1005/0.22-0.3	6	11/03/21				X		X	X	X				
BH1005/0.5-0.6	7	11/03/21			X									
BH1005/1.55-1.65	8	11/03/21				X		X						
BH1007/0.2-0.3	9	11/03/21			X		X		X	X		X		
BD3/100321	10	10/03/21									X			
TS	11	-											X	
TB	12	-											X	
PQL (S) mg/kg														**ANZECC PQLs req'd for all water analytes** ☐

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Metals to Analyse: 8HM unless specified here:

Lab Report/Reference No: 264169.

Total number of samples in container: 12 **Relinquished by:** AS **Transported to laboratory by:** Courier

Send Results to: Douglas Partners Pty Ltd **Address** **Phone:** **Fax:**

Signed: **Received by:** Envirolab **Date & Time:** 12/03/21. 17:57.

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 264169
Date Received: 12/03/21
Time Received: 17:57
Received By:
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd
Attention	David Holden, Alyssa Spencer

Sample Login Details

Your reference	86884.02, Haymarket
Envirolab Reference	264169
Date Sample Received	12/03/2021
Date Instructions Received	12/03/2021
Date Results Expected to be Reported	19/03/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	12 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	10.7
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	VOCs in soil	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBsin Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Asbestos ID - soils	Asbestos ID - soils NEPM	Misc Inorg - Soil	CEC
BH1003/0.25-0.3	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		
BH1003A/0.8-0.9	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
BH1003A/1.9-2.0		✓	✓	✓				✓		✓			
BH1004/0.3-0.4		✓	✓	✓	✓	✓	✓	✓	✓	✓			
BH1004/0.6-0.7	✓	✓	✓	✓				✓		✓			
BH1005/0.22-0.3		✓	✓	✓				✓		✓		✓	✓
BH1005/0.5-0.6		✓	✓	✓	✓	✓	✓	✓	✓	✓			
BH1005/1.55-1.65		✓	✓	✓				✓		✓		✓	✓
BH1007/0.2-0.3	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		
BD3/100321		✓	✓	✓				✓					
TS		✓											
TB		✓											

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 264169-B

Client Details

Client	Douglas Partners Pty Ltd
Attention	David Holden
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**86884.02, Haymarket**
Number of Samples	12 Soil
Date samples received	12/03/2021
Date completed instructions received	19/03/2021

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	26/03/2021
Date of Issue	26/03/2021

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Dragana Tomas, Senior Chemist
Hannah Nguyen, Senior Chemist

Authorised By

Nancy Zhang, Laboratory Manager

TCLP Preparation - Acid					
Our Reference		264169-B-1	264169-B-4	264169-B-7	264169-B-8
Your Reference	UNITS	BH1003/0.25-0.3	BH1004/0.3-0.4	BH1005/0.5-0.6	BH1005/1.55-1.65
Date Sampled		10/03/2021	11/03/2021	11/03/2021	11/03/2021
Type of sample		Soil	Soil	Soil	Soil
pH of soil for fluid# determ.	pH units	9.6	9.5	9.3	9.5
pH of soil TCLP (after HCl)	pH units	1.8	1.8	1.7	1.8
Extraction fluid used	-	1	1	1	1
pH of final Leachate	pH units	5.2	5.2	5.1	5.3

PAHs in TCLP (USEPA 1311)					
Our Reference		264169-B-1	264169-B-4	264169-B-7	264169-B-8
Your Reference	UNITS	BH1003/0.25-0.3	BH1004/0.3-0.4	BH1005/0.5-0.6	BH1005/1.55-1.65
Date Sampled		10/03/2021	11/03/2021	11/03/2021	11/03/2021
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	24/03/2021	24/03/2021	24/03/2021	24/03/2021
Date analysed	-	24/03/2021	24/03/2021	24/03/2021	24/03/2021
Naphthalene in TCLP	mg/L	<0.001	<0.001	<0.001	0.097
Acenaphthylene in TCLP	mg/L	<0.001	<0.001	<0.001	0.007
Acenaphthene in TCLP	mg/L	<0.001	<0.001	<0.001	0.018
Fluorene in TCLP	mg/L	<0.001	<0.001	<0.001	0.026
Phenanthrene in TCLP	mg/L	<0.001	<0.001	0.001	0.076
Anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	0.011
Fluoranthene in TCLP	mg/L	<0.001	<0.001	<0.001	0.009
Pyrene in TCLP	mg/L	<0.001	<0.001	<0.001	0.007
Benzo(a)anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Chrysene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002	<0.002	<0.002	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Total +ve PAH's	mg/L	NIL (+)VE	NIL (+)VE	0.001	0.25
Surrogate p-Terphenyl-d14	%	92	90	87	82

Metals in TCLP USEPA1311		
Our Reference		264169-B-8
Your Reference	UNITS	BH1005/1.55-1.65
Date Sampled		11/03/2021
Type of sample		Soil
Date extracted	-	25/03/2021
Date analysed	-	25/03/2021
Lead in TCLP	mg/L	0.36

Method ID	Methodology Summary
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using in house method INORG-004. Please note that the mass used may be scaled down from the default based on sample mass available.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Org-022/025	Leachates are extracted with Dichloromethane and analysed by GC-MS/GC-MSMS.

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	264169-B-4
Date extracted	-			24/03/2021	[NT]	[NT]	[NT]	[NT]	24/03/2021	24/03/2021
Date analysed	-			24/03/2021	[NT]	[NT]	[NT]	[NT]	24/03/2021	24/03/2021
Naphthalene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	70	80
Acenaphthylene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	78	73
Fluorene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	84	79
Phenanthrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	88	85
Anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	79	78
Pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	80	79
Benzo(a)anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	80	78
Benzo(bjk)fluoranthene in TCLP	mg/L	0.002	Org-022/025	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	73	72
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	92	[NT]	[NT]	[NT]	[NT]	95	90

QUALITY CONTROL: Metals in TCLP USEPA1311						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			25/03/2021	[NT]	[NT]	[NT]	[NT]	25/03/2021	[NT]
Date analysed	-			25/03/2021	[NT]	[NT]	[NT]	[NT]	25/03/2021	[NT]
Lead in TCLP	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	[NT]	[NT]	101	[NT]

Result Definitions

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NA	Test not required
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<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

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Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

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Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

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When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

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Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Ming To

From: Aileen Hie
Sent: Friday, 19 March 2021 6:30 PM
To: Ming To
Subject: FW: 264169 86884.02, Haymarket- Additional TCLP

Follow Up Flag: Follow up
Flag Status: Flagged

Ref: 264169-B.
TAT: Standard.
Due: 26/03/2021
MT

From: David Holden <David.Holden@douglaspartners.com.au>
Sent: Friday, 19 March 2021 6:24 PM
To: Aileen Hie <AHie@envirolab.com.au>
Subject: 264169 86884.02, Haymarket- Additional TCLP

CAUTION: This email originated from outside of the organisation. Do not act on instructions, click links or open attachments unless you recognise the sender and know the content is authentic and safe.

Hi Aileen,

Could you please undertake additional TCLP analysis on the following:

- Sample 246169-1 (BH1003/0.25-0.3): TCLP – PAH
- Sample 246169-4 (BH1004/0.3-0.4): TCLP – PAH
- Sample 246169-7 (BH1005/0.5-0.6): TCLP – PAH
- Sample 246169-8 (BH1005/1.55-1.65): TCLP – PAH, lead

Could I please get these prepped before Wednesday due to holding times. Standard TAT on the analysis and reporting is fine.

Thanks

Dave

David Holden | Environmental Scientist
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685
P: 02 8878 0652 | M: 0414 768 997 | E: David.Holden@douglaspartners.com.au



To find information on our COVID-19 measures, please visit douglaspartners.com.au/news/covid-19

CLIENT
2020 W

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From: Greta Petzold [mailto:GPetzold@envirolab.com.au]
Sent: Friday, 19 March 2021 5:01 PM
To: David Holden; Alyssa Spencer
Subject: Results for Registration 264169 86884.02, Haymarket

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd
Attention	David Holden

Sample Login Details

Your reference	86884.02, Haymarket
Envirolab Reference	264169-B
Date Sample Received	12/03/2021
Date Instructions Received	19/03/2021
Date Results Expected to be Reported	26/03/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	12 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	10.7
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

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Sample ID	TCLP Preparation - Acid	Naphthalene in TCLP	Acenaphthylene in TCLP	Acenaphthene in TCLP	Fluorene in TCLP	Phenanthrene in TCLP	Anthracene in TCLP	Fluoranthene in TCLP	Pyrene in TCLP	Benzo(a)anthracene in TCLP	Chrysene in TCLP	Benzo(bjk)fluoranthene in TCLP	Benzo(a)pyrene in TCLP	Indeno(1,2,3-c,d)pyrene - TCLP	Dibenzo(a,h)anthracene in TCLP	Benzo(g,h,i)perylene in TCLP	Total +vePAH's	Surrogate p-Terphenyl-d14	Lead in TCLP	On Hold
BH1003/0.25-0.3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
BH1003A/0.8-0.9																				✓
BH1003A/1.9-2.0																				✓
BH1004/0.3-0.4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
BH1004/0.6-0.7																				✓
BH1005/0.22-0.3																				✓
BH1005/0.5-0.6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
BH1005/1.55-1.65	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BH1007/0.2-0.3																				✓
BD3/100321																				✓
TS																				✓
TB																				✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

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Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt. Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

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CERTIFICATE OF ANALYSIS 264455

Client Details

Client	Douglas Partners Pty Ltd
Attention	David Holden
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**86884.02, Haymarket**
Number of Samples	5 SOIL
Date samples received	17/03/2021
Date completed instructions received	17/03/2021

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	24/03/2021
Date of Issue	24/03/2021

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Asbestos Approved By
Analysed by Asbestos Approved Identifier: Lucy Zhu
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Diego Bigolin, Team Leader, Inorganics
Dragana Tomas, Senior Chemist
Ken Nguyen, Reporting Supervisor
Lucy Zhu, Asbestos Supervisor
Priya Samarawickrama, Senior Chemist
Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil					
Our Reference		264455-1	264455-2	264455-4	264455-5
Your Reference	UNITS	1001/0.25-0.3	1001/0.5-0.6	1002/0.25-0.35	1002/0.35-0.5
Date Sampled		12/03/2021	12/03/2021	11/03/2021	11/03/2021
Type of sample		SOIL	SOIL	SOIL	SOIL
Date extracted	-	18/03/2021	18/03/2021	18/03/2021	18/03/2021
Date analysed	-	19/03/2021	19/03/2021	19/03/2021	19/03/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	101	103	103	102

svTRH (C10-C40) in Soil					
Our Reference		264455-1	264455-2	264455-4	264455-5
Your Reference	UNITS	1001/0.25-0.3	1001/0.5-0.6	1002/0.25-0.35	1002/0.35-0.5
Date Sampled		12/03/2021	12/03/2021	11/03/2021	11/03/2021
Type of sample		SOIL	SOIL	SOIL	SOIL
Date extracted	-	18/03/2021	18/03/2021	18/03/2021	18/03/2021
Date analysed	-	20/03/2021	20/03/2021	20/03/2021	20/03/2021
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50
Surrogate o-Terphenyl	%	82	81	88	81

PAHs in Soil					
Our Reference		264455-1	264455-2	264455-4	264455-5
Your Reference	UNITS	1001/0.25-0.3	1001/0.5-0.6	1002/0.25-0.35	1002/0.35-0.5
Date Sampled		12/03/2021	12/03/2021	11/03/2021	11/03/2021
Type of sample		SOIL	SOIL	SOIL	SOIL
Date extracted	-	18/03/2021	18/03/2021	18/03/2021	18/03/2021
Date analysed	-	19/03/2021	19/03/2021	19/03/2021	19/03/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	0.1	<0.1
Pyrene	mg/kg	0.2	<0.1	0.2	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	0.1	<0.1
Chrysene	mg/kg	0.1	<0.1	0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.1	<0.05	0.1	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	0.73	<0.05	0.65	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	102	106	105	105

Organochlorine Pesticides in soil		
Our Reference		264455-1
Your Reference	UNITS	1001/0.25-0.3
Date Sampled		12/03/2021
Type of sample		SOIL
Date extracted	-	18/03/2021
Date analysed	-	19/03/2021
alpha-BHC	mg/kg	<0.1
HCB	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Surrogate TCMX	%	110

Organophosphorus Pesticides in Soil		
Our Reference		264455-1
Your Reference	UNITS	1001/0.25-0.3
Date Sampled		12/03/2021
Type of sample		SOIL
Date extracted	-	18/03/2021
Date analysed	-	19/03/2021
Dichlorvos	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion	mg/kg	<0.1
Chlorpyriphos	mg/kg	<0.1
Parathion	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Ethion	mg/kg	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1
Surrogate TCMX	%	110

PCBs in Soil		
Our Reference		264455-1
Your Reference	UNITS	1001/0.25-0.3
Date Sampled		12/03/2021
Type of sample		SOIL
Date extracted	-	18/03/2021
Date analysed	-	19/03/2021
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate TCMX	%	110

Acid Extractable metals in soil					
Our Reference		264455-1	264455-2	264455-4	264455-5
Your Reference	UNITS	1001/0.25-0.3	1001/0.5-0.6	1002/0.25-0.35	1002/0.35-0.5
Date Sampled		12/03/2021	12/03/2021	11/03/2021	11/03/2021
Type of sample		SOIL	SOIL	SOIL	SOIL
Date prepared	-	19/03/2021	19/03/2021	19/03/2021	19/03/2021
Date analysed	-	19/03/2021	19/03/2021	19/03/2021	19/03/2021
Arsenic	mg/kg	<4	6	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	4	7	6	6
Copper	mg/kg	13	4	20	3
Lead	mg/kg	11	7	13	4
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	4	<1	4	<1
Zinc	mg/kg	16	5	28	6

Misc Soil - Inorg		
Our Reference		264455-1
Your Reference	UNITS	1001/0.25-0.3
Date Sampled		12/03/2021
Type of sample		SOIL
Date prepared	-	18/03/2021
Date analysed	-	18/03/2021
Total Phenolics (as Phenol)	mg/kg	<5

Moisture					
Our Reference		264455-1	264455-2	264455-4	264455-5
Your Reference	UNITS	1001/0.25-0.3	1001/0.5-0.6	1002/0.25-0.35	1002/0.35-0.5
Date Sampled		12/03/2021	12/03/2021	11/03/2021	11/03/2021
Type of sample		SOIL	SOIL	SOIL	SOIL
Date prepared	-	18/03/2021	18/03/2021	18/03/2021	18/03/2021
Date analysed	-	19/03/2021	19/03/2021	19/03/2021	19/03/2021
Moisture	%	13	13	12	10

Asbestos ID - soils			
Our Reference		264455-1	264455-4
Your Reference	UNITS	1001/0.25-0.3	1002/0.25-0.35
Date Sampled		12/03/2021	11/03/2021
Type of sample		SOIL	SOIL
Date analysed	-	19/03/2021	19/03/2021
Sample mass tested	g	Approx. 55g	Approx. 55g
Sample Description	-	Beige coarse-grained soil & rocks	Beige coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Asbestos comments	-	NO	NO
Trace Analysis	-	No asbestos detected	No asbestos detected

Misc Inorg - Soil		
Our Reference		264455-5
Your Reference	UNITS	1002/0.35-0.5
Date Sampled		11/03/2021
Type of sample		SOIL
Date prepared	-	22/03/2021
Date analysed	-	22/03/2021
pH 1:5 soil:water	pH Units	7.9

CEC		
Our Reference		264455-5
Your Reference	UNITS	1002/0.35-0.5
Date Sampled		11/03/2021
Type of sample		SOIL
Date prepared	-	23/03/2021
Date analysed	-	23/03/2021
Exchangeable Ca	meq/100g	8.7
Exchangeable K	meq/100g	0.2
Exchangeable Mg	meq/100g	1.2
Exchangeable Na	meq/100g	<0.1
Cation Exchange Capacity	meq/100g	10

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.

Method ID	Methodology Summary
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			18/03/2021	1	18/03/2021	18/03/2021		18/03/2021	[NT]
Date analysed	-			19/03/2021	1	19/03/2021	19/03/2021		19/03/2021	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	103	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	103	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	106	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	107	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	104	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	100	[NT]
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	108	[NT]
naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	105	1	101	101	0	106	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			18/03/2021	1	18/03/2021	18/03/2021		18/03/2021	[NT]
Date analysed	-			19/03/2021	1	20/03/2021	20/03/2021		19/03/2021	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	111	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	77	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	92	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	111	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	<100	<100	0	77	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	92	[NT]
Surrogate o-Terphenyl	%		Org-020	83	1	82	81	1	100	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			18/03/2021	1	18/03/2021	18/03/2021		18/03/2021	[NT]
Date analysed	-			19/03/2021	1	19/03/2021	19/03/2021		19/03/2021	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	97	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	91	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	91	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	95	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	1	0.1	0.1	0	100	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	0.2	0.2	0	100	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	0.1	0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	1	0.1	0.1	0	108	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	1	0.1	0.1	0	103	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	1	0.1	0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	106	1	102	101	1	101	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			18/03/2021	1	18/03/2021	18/03/2021		18/03/2021	[NT]
Date analysed	-			19/03/2021	1	19/03/2021	19/03/2021		19/03/2021	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	94	[NT]
HCB	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	89	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	87	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	99	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	97	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	101	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	99	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	91	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	97	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	97	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	113	1	110	107	3	101	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			18/03/2021	1	18/03/2021	18/03/2021		18/03/2021	[NT]
Date analysed	-			19/03/2021	1	19/03/2021	19/03/2021		19/03/2021	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	76	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	98	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	93	[NT]
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	124	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	99	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	96	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	109	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	113	1	110	107	3	101	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			18/03/2021	1	18/03/2021	18/03/2021		18/03/2021	[NT]
Date analysed	-			19/03/2021	1	19/03/2021	19/03/2021		19/03/2021	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	80	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	113	1	110	107	3	101	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date prepared	-			19/03/2021	1	19/03/2021	19/03/2021		19/03/2021	[NT]
Date analysed	-			19/03/2021	1	19/03/2021	19/03/2021		19/03/2021	[NT]
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	108	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	107	[NT]
Chromium	mg/kg	1	Metals-020	<1	1	4	5	22	104	[NT]
Copper	mg/kg	1	Metals-020	<1	1	13	13	0	105	[NT]
Lead	mg/kg	1	Metals-020	<1	1	11	10	10	102	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	106	[NT]
Nickel	mg/kg	1	Metals-020	<1	1	4	4	0	105	[NT]
Zinc	mg/kg	1	Metals-020	<1	1	16	14	13	106	[NT]

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date prepared	-			18/03/2021	1	18/03/2021	18/03/2021		18/03/2021	[NT]
Date analysed	-			18/03/2021	1	18/03/2021	18/03/2021		18/03/2021	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	1	<5	<5	0	102	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date prepared	-			22/03/2021	[NT]	[NT]	[NT]	[NT]	22/03/2021	[NT]
Date analysed	-			22/03/2021	[NT]	[NT]	[NT]	[NT]	22/03/2021	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: CEC					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date prepared	-			23/03/2021	[NT]	[NT]	[NT]	[NT]	23/03/2021	[NT]
Date analysed	-			23/03/2021	[NT]	[NT]	[NT]	[NT]	23/03/2021	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	120	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	130	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	120	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	123	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Asbestos: A portion of the supplied sample was sub-sampled for asbestos analysis according to Envirolab procedures.
We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g of sample in its own container.
Note: Samples 264455-1 & 4 were sub-sampled from jars provided by the client.

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	86884.02	**Suburb:**	Haymarket	**To:**	Envirolab Services
Project Name:	Haymarkert Contamination Investigation	**Order Number**			12 Ashley Street, Chatswood 2067
Project Manager:	David Holden	**Sampler:**	AS/IT	**Attn:**	Aileen Hie
Emails:	david.holden@douglaspartners.com.au alyssa.spencer@douglaspartners.com.au			**Phone:**	9910 6200
Date Required:	Std			**Email:**	ahie@envirolab.com.au
Prior Storage:	Esky/Fridge	Do samples contain 'potential' HBM?	Yes		

Sample ID	Lab ID	Date Sampled	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Analytes: Combo 8A	Combo 8	Combo 3a	Combo 3	500 AF/FA	ph and CEC	on hold			Notes/preservation
1001/0.25-0.3	1	12/03/21	S	G	x									
1001/0.5-0.6	2	12/03/21	S	G				x						
1001/0.9-1.0	3	12/03/21	S	G							x			
1002/0.25-0.35	4	11/03/21	S	G			x							
1002/0.35-0.5	5	11/03/21	S	G				x		x				
BD1/110321	~~6~~ (24)	11/03/21	S	G				x						Please forward for interlab analysis (Combo 3 - metals, TRH, BTEX, PAH)
PQL (S) mg/kg														**ANZECC PQLs req'd for all water analytes** ☐

ENVIROLAB GROUP
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 264455
Date Received: 17/3/2021
Time Received: 12:50
Received By: R
Temp: Cool/Ambient 11°C
Cooling: Ice/Icepack
Security: Intact/Broken/None

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Metals to Analyse: 8HM unless specified here:

Lab Report/Reference No:

Total number of samples in container: 6 **Relinquished by:** DIH **Transported to laboratory by:** Bonds

Send Results to: Douglas Partners Pty Ltd **Address:** **Phone:** **Fax:**

Signed: DIH 17/3/21 10:45 **Received by:** **Date & Time:** 17/3/2021 1250

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd
Attention	David Holden

Sample Login Details

Your reference	86884.02, Haymarket
Envirolab Reference	264455
Date Sample Received	17/03/2021
Date Instructions Received	17/03/2021
Date Results Expected to be Reported	24/03/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	5 SOIL
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	11
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	vTRH(C6-C10)/BTEXN in Soil	sVTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBsin Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Asbestos ID - soils	Misc Inorg - Soil	CEC	On Hold
1001/0.25-0.3	✓	✓	✓	✓	✓	✓	✓	✓	✓			
1001/0.5-0.6	✓	✓	✓				✓					
1001/0.9-1.0												✓
1002/0.25-0.35	✓	✓	✓				✓		✓			
1002/0.35-0.5	✓	✓	✓				✓			✓	✓	

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

Envirolab Services Pty Ltd
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12 Ashley St Chatswood NSW 2067
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CERTIFICATE OF ANALYSIS 264957

Client Details

Client	Douglas Partners Pty Ltd
Attention	David Holden
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**86884.02, Haymarket Contamination Investigation**
Number of Samples	9 soil
Date samples received	23/03/2021
Date completed instructions received	23/03/2021

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	30/03/2021
Date of Issue	30/03/2021

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Asbestos Approved By
Analysed by Asbestos Approved Identifier: Ridwan Wijaya
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Diego Bigolin, Team Leader, Inorganics
Dragana Tomas, Senior Chemist
Jaimie Loa-Kum-Cheung, Metals Supervisor
Ken Nguyen, Reporting Supervisor
Lucy Zhu, Asbestos Supervisor
Priya Samarawickrama, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		264957-1	264957-2	264957-3	264957-4	264957-5
Your Reference	UNITS	1004A	1005	1007	1007	1007
Depth		3.1-3.55	2.8-2.95	2.0-2.1	2.5-2.95	4.0-4.45
Date Sampled		17/03/2021	15/03/2021	16/03/2021	16/03/2021	16/03/2021
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	24/03/2021	24/03/2021	24/03/2021	24/03/2021	24/03/2021
Date analysed	-	25/03/2021	25/03/2021	25/03/2021	25/03/2021	25/03/2021
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	67	81	82	79	77

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		264957-6
Your Reference	UNITS	BD1/160321
Depth		.
Date Sampled		16/03/2021
Type of sample		soil
Date extracted	-	24/03/2021
Date analysed	-	25/03/2021
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<3
Surrogate aaa-Trifluorotoluene	%	74

svTRH (C10-C40) in Soil						
Our Reference		264957-1	264957-2	264957-3	264957-4	264957-5
Your Reference	UNITS	1004A	1005	1007	1007	1007
Depth		3.1-3.55	2.8-2.95	2.0-2.1	2.5-2.95	4.0-4.45
Date Sampled		17/03/2021	15/03/2021	16/03/2021	16/03/2021	16/03/2021
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	24/03/2021	24/03/2021	24/03/2021	24/03/2021	24/03/2021
Date analysed	-	24/03/2021	25/03/2021	25/03/2021	25/03/2021	25/03/2021
TRH C_{10} - C_{14}	mg/kg	320	<50	<50	<50	76
TRH C_{15} - C_{28}	mg/kg	130	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	140	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	320	<50	<50	<50	76
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	320	<50	<50	<50	76
TRH >C_{16} -C_{34}	mg/kg	250	110	120	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	590	<50	<50	<50	80
Total +ve TRH (>C10-C40)	mg/kg	570	110	120	<50	80
Surrogate o-Terphenyl	%	98	112	112	98	108

svTRH (C10-C40) in Soil		
Our Reference		264957-6
Your Reference	UNITS	BD1/160321
Depth		.
Date Sampled		16/03/2021
Type of sample		soil
Date extracted	-	24/03/2021
Date analysed	-	25/03/2021
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	<100
TRH >C_{10} -C_{16}	mg/kg	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50
TRH >C_{16} -C_{34}	mg/kg	<100
TRH >C_{34} -C_{40}	mg/kg	<100
Total +ve TRH (C10-C36)	mg/kg	<50
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	107

PAHs in Soil						
Our Reference		264957-1	264957-2	264957-3	264957-4	264957-5
Your Reference	UNITS	1004A	1005	1007	1007	1007
Depth		3.1-3.55	2.8-2.95	2.0-2.1	2.5-2.95	4.0-4.45
Date Sampled		17/03/2021	15/03/2021	16/03/2021	16/03/2021	16/03/2021
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	24/03/2021	24/03/2021	24/03/2021	24/03/2021	24/03/2021
Date analysed	-	25/03/2021	25/03/2021	25/03/2021	24/03/2021	25/03/2021
Naphthalene	mg/kg	<0.1	0.1	0.2	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	0.2	0.4	0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Fluorene	mg/kg	<0.1	0.1	0.3	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.9	2.0	0.4	<0.1
Anthracene	mg/kg	<0.1	0.3	0.6	0.2	<0.1
Fluoranthene	mg/kg	<0.1	1.2	2.8	0.6	<0.1
Pyrene	mg/kg	<0.1	1.1	2.6	0.6	<0.1
Benzo(a)anthracene	mg/kg	<0.1	0.6	1.6	0.4	<0.1
Chrysene	mg/kg	<0.1	0.5	1.3	0.3	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	0.8	2.1	0.4	<0.2
Benzo(a)pyrene	mg/kg	<0.05	0.54	1.5	0.2	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.2	0.8	0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.2	0.8	0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	7.0	17	3.5	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	0.7	2.1	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	0.8	2.1	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	0.8	2.1	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	100	100	100	110	98

PAHs in Soil		
Our Reference		264957-6
Your Reference	UNITS	BD1/160321
Depth		.
Date Sampled		16/03/2021
Type of sample		soil
Date extracted	-	24/03/2021
Date analysed	-	25/03/2021
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Total +ve PAH's	mg/kg	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Surrogate p-Terphenyl-d14	%	98

Organochlorine Pesticides in soil		
Our Reference		264957-4
Your Reference	UNITS	1007
Depth		2.5-2.95
Date Sampled		16/03/2021
Type of sample		soil
Date extracted	-	24/03/2021
Date analysed	-	24/03/2021
alpha-BHC	mg/kg	<0.1
HCB	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Surrogate TCMX	%	103

Organophosphorus Pesticides in Soil		
Our Reference		264957-4
Your Reference	UNITS	1007
Depth		2.5-2.95
Date Sampled		16/03/2021
Type of sample		soil
Date extracted	-	24/03/2021
Date analysed	-	24/03/2021
Dichlorvos	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion	mg/kg	<0.1
Chlorpyriphos	mg/kg	<0.1
Parathion	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Ethion	mg/kg	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1
Surrogate TCMX	%	103

PCBs in Soil		
Our Reference		264957-4
Your Reference	UNITS	1007
Depth		2.5-2.95
Date Sampled		16/03/2021
Type of sample		soil
Date extracted	-	24/03/2021
Date analysed	-	24/03/2021
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate TCMX	%	103

Acid Extractable metals in soil						
Our Reference		264957-1	264957-2	264957-3	264957-4	264957-5
Your Reference	UNITS	1004A	1005	1007	1007	1007
Depth		3.1-3.55	2.8-2.95	2.0-2.1	2.5-2.95	4.0-4.45
Date Sampled		17/03/2021	15/03/2021	16/03/2021	16/03/2021	16/03/2021
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	24/03/2021	24/03/2021	24/03/2021	24/03/2021	24/03/2021
Date analysed	-	24/03/2021	24/03/2021	24/03/2021	24/03/2021	24/03/2021
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	2	3	11	4	1
Copper	mg/kg	6	4	23	2	<1
Lead	mg/kg	5	15	51	8	<1
Mercury	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Nickel	mg/kg	2	1	3	1	<1
Zinc	mg/kg	48	14	49	11	4

Acid Extractable metals in soil			
Our Reference		264957-6	264957-10
Your Reference	UNITS	BD1/160321	1007 - [TRIPLICATE]
Depth		.	2.5-2.95
Date Sampled		16/03/2021	16/03/2021
Type of sample		soil	soil
Date prepared	-	24/03/2021	24/03/2021
Date analysed	-	24/03/2021	24/03/2021
Arsenic	mg/kg	<4	<4
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	1	8
Copper	mg/kg	<1	8
Lead	mg/kg	<1	27
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	<1	2
Zinc	mg/kg	6	13

Misc Soil - Inorg		
Our Reference		264957-4
Your Reference	UNITS	1007
Depth		2.5-2.95
Date Sampled		16/03/2021
Type of sample		soil
Date prepared	-	24/03/2021
Date analysed	-	24/03/2021
Total Phenolics (as Phenol)	mg/kg	<5

Moisture						
Our Reference		264957-1	264957-2	264957-3	264957-4	264957-5
Your Reference	UNITS	1004A	1005	1007	1007	1007
Depth		3.1-3.55	2.8-2.95	2.0-2.1	2.5-2.95	4.0-4.45
Date Sampled		17/03/2021	15/03/2021	16/03/2021	16/03/2021	16/03/2021
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	24/03/2021	24/03/2021	24/03/2021	24/03/2021	24/03/2021
Date analysed	-	25/03/2021	25/03/2021	25/03/2021	25/03/2021	25/03/2021
Moisture	%	19	9.0	11	8.6	17

Moisture		
Our Reference		264957-6
Your Reference	UNITS	BD1/160321
Depth		.
Date Sampled		16/03/2021
Type of sample		soil
Date prepared	-	24/03/2021
Date analysed	-	25/03/2021
Moisture	%	15

Asbestos ID - soils NEPM		
Our Reference		264957-3
Your Reference	UNITS	1007
Depth		2.0-2.1
Date Sampled		16/03/2021
Type of sample		soil
Date analysed	-	25/03/2021
Sample mass tested	g	1,047.88
Sample Description	-	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1
Asbestos ID in soil <0.1g/kg*	-	Chrysotile
ACM >7mm Estimation*	g	–
FA and AF Estimation*	g	0.0169
FA and AF Estimation*#2	%(w/w)	0.0016

Asbestos ID - soils		
Our Reference		264957-4
Your Reference	UNITS	1007
Depth		2.5-2.95
Date Sampled		16/03/2021
Type of sample		soil
Date analysed	-	26/03/2021
Sample mass tested	g	Approx. 30g
Sample Description	-	Red coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Asbestos comments	-	NO
Trace Analysis	-	No asbestos detected

CEC		
Our Reference		264957-3
Your Reference	UNITS	1007
Depth		2.0-2.1
Date Sampled		16/03/2021
Type of sample		soil
Date prepared	-	29/03/2021
Date analysed	-	29/03/2021
Exchangeable Ca	meq/100g	3.1
Exchangeable K	meq/100g	0.1
Exchangeable Mg	meq/100g	<0.1
Exchangeable Na	meq/100g	<0.1
Cation Exchange Capacity	meq/100g	3.3

Misc Inorg - Soil		
Our Reference		264957-3
Your Reference	UNITS	1007
Depth		2.0-2.1
Date Sampled		16/03/2021
Type of sample		soil
Date prepared	-	24/03/2021
Date analysed	-	24/03/2021
pH 1:5 soil:water	pH Units	9.8

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) **NOTE** #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.

Method ID	Methodology Summary
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	264957-4
Date extracted	-			24/03/2021	[NT]	[NT]	[NT]	[NT]	24/03/2021	24/03/2021
Date analysed	-			25/03/2021	[NT]	[NT]	[NT]	[NT]	25/03/2021	25/03/2021
TRH C_6 - C_9	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	89	90
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	89	90
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	95	107
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	99	96
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	90	88
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	81	80
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	85	83
naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	92	[NT]	[NT]	[NT]	[NT]	91	88

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	264957-4
Date extracted	-			24/03/2021	[NT]	[NT]	[NT]	[NT]	24/03/2021	24/03/2021
Date analysed	-			24/03/2021	[NT]	[NT]	[NT]	[NT]	24/03/2021	25/03/2021
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	116	117
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	93	117
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	102	105
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	116	117
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	93	117
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	102	105
Surrogate o-Terphenyl	%		Org-020	104	[NT]	[NT]	[NT]	[NT]	116	98

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	264957-4
Date extracted	-			24/03/2021	[NT]	[NT]	[NT]	[NT]	24/03/2021	24/03/2021
Date analysed	-			25/03/2021	[NT]	[NT]	[NT]	[NT]	24/03/2021	24/03/2021
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	105	116
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	103	126
Fluorene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	111	114
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	117	98
Anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	96	124
Pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	107	124
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	114	116
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	113	106
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	103	[NT]	[NT]	[NT]	[NT]	116	111

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	264957-4
Date extracted	-			24/03/2021	[NT]	[NT]	[NT]	[NT]	24/03/2021	24/03/2021
Date analysed	-			24/03/2021	[NT]	[NT]	[NT]	[NT]	24/03/2021	24/03/2021
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	108	83
HCB	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	120	80
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	105	79
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	105	90
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	118	88
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	101	92
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	115	93
Endrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	98	91
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	106	88
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	95	80
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	101	[NT]	[NT]	[NT]	[NT]	108	102

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	264957-4
Date extracted	-			24/03/2021	[NT]	[NT]	[NT]	[NT]	24/03/2021	24/03/2021
Date analysed	-			24/03/2021	[NT]	[NT]	[NT]	[NT]	24/03/2021	24/03/2021
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	108	106
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	105	93
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	111	107
Malathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	114	116
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	120	105
Parathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	98	100
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	109	135
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	101	[NT]	[NT]	[NT]	[NT]	108	102

QUALITY CONTROL: PCBs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	264957-4
Date extracted	-			24/03/2021	[NT]	[NT]	[NT]	[NT]	24/03/2021	24/03/2021
Date analysed	-			24/03/2021	[NT]	[NT]	[NT]	[NT]	24/03/2021	24/03/2021
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	110	80
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-021	101	[NT]	[NT]	[NT]	[NT]	108	102

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date prepared	-			24/03/2021	4	24/03/2021	24/03/2021		24/03/2021	[NT]
Date analysed	-			24/03/2021	4	24/03/2021	24/03/2021		24/03/2021	[NT]
Arsenic	mg/kg	4	Metals-020	<4	4	<4	<4	0	107	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	4	<0.4	<0.4	0	110	[NT]
Chromium	mg/kg	1	Metals-020	<1	4	4	7	55	103	[NT]
Copper	mg/kg	1	Metals-020	<1	4	2	3	40	106	[NT]
Lead	mg/kg	1	Metals-020	<1	4	8	14	55	109	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	4	<0.1	<0.1	0	91	[NT]
Nickel	mg/kg	1	Metals-020	<1	4	1	2	67	108	[NT]
Zinc	mg/kg	1	Metals-020	<1	4	11	13	17	110	[NT]

QUALITY CONTROL: Misc Soil - Inorg					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date prepared	-			24/03/2021	[NT]	[NT]	[NT]	[NT]	24/03/2021	[NT]
Date analysed	-			24/03/2021	[NT]	[NT]	[NT]	[NT]	24/03/2021	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: CEC					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			29/03/2021	[NT]	[NT]	[NT]	[NT]	29/03/2021	[NT]
Date analysed	-			29/03/2021	[NT]	[NT]	[NT]	[NT]	29/03/2021	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	124	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date prepared	-			24/03/2021	[NT]	[NT]	[NT]	[NT]	24/03/2021	[NT]
Date analysed	-			24/03/2021	[NT]	[NT]	[NT]	[NT]	24/03/2021	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	102	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Asbestos: A portion of the supplied sample was sub-sampled for asbestos analysis according to Envirolab procedures.
We cannot guarantee that this sub-sample is indicative of the entire sample.
Envirolab recommends supplying 40-50g of sample in its own container.
Note: Sample 264957-4 was sub-sampled from a jar provided by the client.

Asbestos-ID in soil: NEPM
This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

Factual description of asbestos identified in the soil samples: NEPM
Sample 264957-3; Chrysotile asbestos identified in 0.0199g of fibrous matted material

pH
Samples were out of the recommended holding time for this analysis.

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 264957-4 for Cr & Pb. Therefore a triplicate result has been issued as laboratory sample number 264957-10.

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	86884.02	**Suburb:**	Haymarket	**To:**	Envirolab Services
Project Name:	Haymarkert Contamination Investigation	**Order Number**			12 Ashley Street, Chatswood 2067
Project Manager:	David Holden	**Sampler:**	JS	**Attn:**	Aileen Hie
Emails:	david.holden@douglaspartners.com.au alyssa.spencer@douglaspartners.com.au			**Phone:**	9910 6200
Date Required:	Std			**Email:**	ahie@envirolab.com.au
Prior Storage:	Esky/Fridge	Do samples contain 'potential' HBM?	Yes		

Sample ID	Lab ID	Date Sampled	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Analytes: Combo 8a	Combo 3a	Combo 3	ph, CEC						Notes/preservation
1004A/3.1-3.55	1	17/03/21	S	G			x							
1005/2.8-2.95	2	15/03/12	S	G			x							
1007/2.0-2.1	3	16/03/21	S	G		x		x						Asbestos - AF/FA 500 ml
1007/2.5-2.95	4	16/03/21	S	G	x									
1007/4-4.45	5	16/03/12	S	G			x							
BD1/160321	6	16/03/21	S	G			x							
PQL (S) mg/kg														**ANZECC PQLs req'd for all water analytes** ☐

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 264957
Date Received: 23/03/21
Time Received: 13:40
Received By: m
Temp: Cool/Ambient
Cooling: Icepack
Security: Intact/Broken/None

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Metals to Analyse: 8HM unless specified here:

Lab Report/Reference No: 264957

Total number of samples in container: 6 **Relinquished by:** DIH **Transported to laboratory by:** Bonds

Send Results to: Douglas Partners Pty Ltd **Address:** **Phone:** **Fax:**

Signed: DIH 23/3/21 10:45 **Received by:** Envirolab **Date & Time:** 23/3/21 13:40

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	86884.02	**Suburb:**	Haymarket	**To:**	Envirolab Services
Project Name:	Haymarkert Contamination Investigation	**Order Number**			12 Ashley Street, Chatswood 2067
Project Manager:	David Holden	**Sampler:**	JS	**Attn:**	Aileen Hie
Emails:	david.holden@douglaspartners.com.au alyssa.spencer@douglaspartners.com.au			**Phone:**	9910 6200
Date Required:	Std			**Email:**	ahie@envirolab.com.au
Prior Storage:	Esky/Fridge	Do samples contain 'potential' HBM?	Yes		

Sample ID	Lab ID	Sampling Date	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Analytes: Aggresivity									Notes/preservation
BH1004A/4.5-4.95	7	17/03/21	S	P	x									
BH1005/7.0-7.45	8	15/03/21	S	P	x									
BH1007/8.5-8.95	9	16/03/21	S	P	x									
PQL (S) mg/kg													**ANZECC PQLs req'd for all water analytes** ☐	

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 264957
Date Received: 23/3/21
Time Received: 13:40
Received By: [illegible]
Temp: Cool/Ambient
Cooling: Ice/icepack
Security: Intact/Broken/None

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Metals to Analyse: 8HM unless specified here:

Lab Report/Reference No: ~~21495~~ 264957

Total number of samples in container: **Relinquished by:** DIH **Transported to laboratory by:** Bonds

Send Results to: Douglas Partners Pty Ltd **Address:** **Phone:** **Fax:**

Signed: DIH 23/3/21 10:45 **Received by:** Envirolab **Date & Time:** 23/3/21 13:40

Dark

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd
Attention	David Holden

Sample Login Details

Your reference	86884.02, Haymarket Contamination Investigation
Envirolab Reference	264957
Date Sample Received	23/03/2021
Date Instructions Received	23/03/2021
Date Results Expected to be Reported	30/03/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	9 soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	13.6
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBsin Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Asbestos ID - soils	Asbestos ID - soils NEPM	CEC	Misc Inorg - Soil	On Hold
1004A-3.1-3.55	✓	✓	✓				✓						
1005-2.8-2.95	✓	✓	✓				✓						
1007-2.0-2.1	✓	✓	✓				✓			✓	✓	✓	
1007-2.5-2.95	✓	✓	✓	✓	✓	✓	✓	✓	✓				
1007-4.0-4.45	✓	✓	✓				✓						
BD1/160321-.	✓	✓	✓				✓						
BH1004A-4.5-4.95													✓
BH1005-0-7.45													✓
BH1007-8.5-8.95													✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 264957-B

Client Details

Client	Douglas Partners Pty Ltd
Attention	David Holden
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**86884.02, Haymarket Contamination Investigation**
Number of Samples	9 soil
Date samples received	23/03/2021
Date completed instructions received	26/03/2021

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

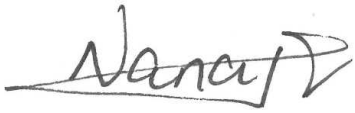
Date results requested by	06/04/2021
Date of Issue	01/04/2021

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Dragana Tomas, Senior Chemist
Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

sTPH in Soil (C10-C40)-Silica				
Our Reference		264957-B-1	264957-B-2	264957-B-5
Your Reference	UNITS	1004A	1005	1007
Depth		3.1-3.55	2.8-2.95	4.0-4.45
Date Sampled		17/03/2021	15/03/2021	16/03/2021
Type of sample		soil	soil	soil
Date extracted	-	30/03/2021	30/03/2021	30/03/2021
Date analysed	-	30/03/2021	30/03/2021	30/03/2021
TPH C_{10} - C_{14}	mg/kg	70	<50	<50
TPH C_{15} - C_{28}	mg/kg	<100	<100	<100
TPH C_{29} - C_{36}	mg/kg	<100	<100	<100
TPH >C_{10} -C_{16}	mg/kg	75	<50	<50
TPH >C_{16} -C_{34}	mg/kg	<100	<100	<100
TPH >C_{34} -C_{40}	mg/kg	<100	<100	<100
Surrogate o-Terphenyl	%	84	79	81

PAHs in TCLP (USEPA 1311)		
Our Reference		264957-B-3
Your Reference	UNITS	1007
Depth		2.0-2.1
Date Sampled		16/03/2021
Type of sample		soil
pH of soil for fluid# determ.	pH units	10.2
pH of soil TCLP (after HCl)	pH units	1.8
Extraction fluid used	-	1
pH of final Leachate	pH units	5.1
Date extracted	-	30/03/2021
Date analysed	-	30/03/2021
Naphthalene in TCLP	mg/L	0.27
Acenaphthylene in TCLP	mg/L	0.090
Acenaphthene in TCLP	mg/L	0.55
Fluorene in TCLP	mg/L	0.64
Phenanthrene in TCLP	mg/L	1.3
Anthracene in TCLP	mg/L	0.37
Fluoranthene in TCLP	mg/L	0.37
Pyrene in TCLP	mg/L	0.27
Benzo(a)anthracene in TCLP	mg/L	<0.001
Chrysene in TCLP	mg/L	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001
Total +ve PAH's	mg/L	3.8
Surrogate p-Terphenyl-d14	%	73

Method ID	Methodology Summary
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using in house method INORG-004. Please note that the mass used may be scaled down from the default based on sample mass available.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-022/025	Leachates are extracted with Dichloromethane and analysed by GC-MS/GC-MSMS.

QUALITY CONTROL: sTPH in Soil (C10-C40)-Silica					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			30/03/2021	[NT]	[NT]	[NT]	[NT]	30/03/2021	[NT]
Date analysed	-			30/03/2021	[NT]	[NT]	[NT]	[NT]	30/03/2021	[NT]
TPH C_{10} - C_{14}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	109	[NT]
TPH C_{15} - C_{28}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	113	[NT]
TPH C_{29} - C_{36}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	102	[NT]
TPH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	109	[NT]
TPH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	113	[NT]
TPH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	102	[NT]
Surrogate o-Terphenyl	%		Org-020	93	[NT]	[NT]	[NT]	[NT]	106	[NT]

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date extracted	-			30/03/2021	3	30/03/2021	30/03/2021		30/03/2021	[NT]
Date analysed	-			30/03/2021	3	30/03/2021	30/03/2021		30/03/2021	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-022/025	<0.001	3	0.27	0.27	0	70	[NT]
Acenaphthylene in TCLP	mg/L	0.001	Org-022/025	<0.001	3	0.090	0.090	0	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.001	Org-022/025	<0.001	3	0.55	0.64	15	73	[NT]
Fluorene in TCLP	mg/L	0.001	Org-022/025	<0.001	3	0.64	0.74	14	77	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-022/025	<0.001	3	1.3	1.4	7	82	[NT]
Anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	3	0.37	0.37	0	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.001	Org-022/025	<0.001	3	0.37	0.37	0	76	[NT]
Pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	3	0.27	0.27	0	79	[NT]
Benzo(a)anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	3	<0.001	<0.001	0	[NT]	[NT]
Chrysene in TCLP	mg/L	0.001	Org-022/025	<0.001	3	<0.001	<0.001	0	82	[NT]
Benzo(bjk)fluoranthene in TCLP	mg/L	0.002	Org-022/025	<0.002	3	<0.002	<0.002	0	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	3	<0.001	<0.001	0	72	[NT]
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.001	Org-022/025	<0.001	3	<0.001	<0.001	0	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	3	<0.001	<0.001	0	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	Org-022/025	<0.001	3	<0.001	<0.001	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	95	3	73	76	4	89	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Ming To

From: Simon Song
Sent: Friday, 26 March 2021 1:43 PM
To: David Holden
Cc: Ming To
Subject: RE: 264957 86884.02, Haymarket Contamination Investigation - Additional TCLP analysis

Follow Up Flag: Follow up
Flag Status: Flagged

Ref: 264957-B
TAT: Standard
Due: 06/04/2021
MT.

Will do

Kind Regards,

Simon Song | Senior Customer Service | Envirolab Services

Great Science. Great Service.

12 Ashley Street Chatswood NSW 2067
T 612 9910 6200
E SSong@envirolab.com.au | W www.envirolab.com.au

Follow us on: LinkedIn | Facebook | Twitter

Samples will be analysed per our T&C's.

From: David Holden <David.Holden@douglaspartners.com.au>
Sent: Friday, 26 March 2021 1:09 PM
To: Simon Song <SSong@envirolab.com.au>
Subject: FW: 264957 86884.02, Haymarket Contamination Investigation - Additional TCLP analysis

CAUTION: This email originated from outside of the organisation. Do not act on instructions, click links or open attachments unless you recognise the sender and know the content is authentic and safe.

Hi Simon

Could you please run the following additional analysis for 264957 86884.02, Haymarket Contamination Investigation

Sample 264957-1 (1004A/3.1-3.55): TPH Silica gel clean up.
Sample 264957-2 (1005/2.8-2.95): TPH Silica gel clean up
Sample 264957-3 (1007/2-2.1): TCLP PAH
Sample 264957-5 (1007/4-4.45): TPH Silica gel clean up.

Standard TAT is fine.

Thanks

Dave

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd
Attention	David Holden

Sample Login Details

Your reference	86884.02, Haymarket Contamination Investigation
Envirolab Reference	264957-B
Date Sample Received	23/03/2021
Date Instructions Received	26/03/2021
Date Results Expected to be Reported	06/04/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	9 soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	13.6
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	sTPH in Soil (C10-C40)-Silica	pH of soil for fluid#determ.	pH of soil TCLP (after HCl)	Extraction fluid used	pH of final Leachate	Naphthalene in TCLP	Acenaphthylene in TCLP	Acenaphthene in TCLP	Fluorene in TCLP	Phenanthrene in TCLP	Anthracene in TCLP	Fluoranthene in TCLP	Pyrene in TCLP	Benzo(a)anthracene in TCLP	Chrysene in TCLP	Benzo(bjk)fluoranthene in TCLP	Benzo(a)pyrene in TCLP	Indeno(1,2,3-c,d)pyrene - TCLP	Dibenzo(a,h)anthracene in TCLP	Benzo(g,h,i)perylene in TCLP	Total +vePAH's	Surrogate p-Terphenyl-d14	On Hold
1004A-3.1-3.55	✓																						
1005-2.8-2.95	✓																						
1007-2.0-2.1		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
1007-2.5-2.95																							✓
1007-4.0-4.45	✓																						
BD1/160321-.																							✓
BH1004A-4.5-4.95																							✓
BH1005-0-7.45																							✓
BH1007-8.5-8.95																							✓
1007 - [TRIPLICATE]-2.5-2.95																							✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2109750**	Page	: 1 of 5
Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR DAVID HOLDEN	Contact	: Sepan Mahamad
Address	: UNIT 1, 22 WALTHAM STREET	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 9809 0666	Telephone	: +61 2 8784 8555
Project	: 86884.02 Haymarket contamination Investigation	Date Samples Received	: 18-Mar-2021 15:30
Order number	: ----	Date Analysis Commenced	: 22-Mar-2021
C-O-C number	: ----	Issue Date	: 24-Mar-2021 23:46
Sampler	: AS/IT		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
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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.

Signatories	*Position*	*Accreditation Category*
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.

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BD1/110321	----	----	----	----
			Sampling date / time	11-Mar-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2109750-001	--------	--------	--------	--------
				Result	----	----	----	----
EA055: Moisture Content								
Moisture Content	----	1.0	%	**12.0**	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	**2**	----	----	----	----
Copper	7440-50-8	5	mg/kg	<5	----	----	----	----
Lead	7439-92-1	5	mg/kg	<5	----	----	----	----
Nickel	7440-02-0	2	mg/kg	<2	----	----	----	----
Zinc	7440-66-6	5	mg/kg	**7**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	<10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg	<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg	<50	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg	<50	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	----	----	----
^ **Sum of BTEX**	----	0.2	mg/kg	<0.2	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BD1/110321	----	----	----	----
				Sampling date / time	11-Mar-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2109750-001	--------	--------	--------	--------
					Result	----	----	----	----
EP080: BTEXN - Continued									
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**78.0**	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		**85.4**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		**83.3**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) 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

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES2109750**	Page	: 1 of 5
Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR DAVID HOLDEN	Contact	: Sepan Mahamad
Address	: UNIT 1, 22 WALTHAM STREET	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 9809 0666	Telephone	: +61 2 8784 8555
Project	: 86884.02 Haymarket contamination Investigation	Date Samples Received	: 18-Mar-2021
Order number	: ----	Date Analysis Commenced	: 22-Mar-2021
C-O-C number	: ----	Issue Date	: 24-Mar-2021
Sampler	: AS/IT		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
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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*
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)T: Total Metals by ICP-AES (QC Lot: 3578659)									
ES2109679-005	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	7	9	18.4	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	14	22	40.0	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	32	34	7.76	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	10	8	20.2	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	26	34	27.4	No Limit
ES2109732-022	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	11	11	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	8	8	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	5	5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	18	18	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	11	13	12.6	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	29	29	0.00	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3578663)									
ES2109708-001	Anonymous	EA055: Moisture Content	----	0.1	%	16.4	16.0	2.63	0% - 50%
ES2109750-001	BD1/110321	EA055: Moisture Content	----	0.1	%	12.0	11.6	2.66	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3578660)									
ES2109679-005	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES2109732-022	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3576424)									
ES2109750-001	BD1/110321	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	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 (%)*
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3576424) - continued									
ES2109679-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	150	190	23.4	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	180	200	10.5	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3576797)									
ES2109679-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES2109750-001	BD1/110321	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3576424)									
ES2109750-001	BD1/110321	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES2109679-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	270	330	21.2	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	230	210	9.14	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3576797)									
ES2109679-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES2109750-001	BD1/110321	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080: BTEXN (QC Lot: 3576797)									
ES2109679-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
ES2109750-001	BD1/110321	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	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 Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3578659)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	94.5	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	110	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	20.2 mg/kg	101	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	102	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	62.1 mg/kg	93.9	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.4 mg/kg	94.1	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	162 mg/kg	76.6	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3578660)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.073 mg/kg	96.7	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3576424)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	104	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	97.3	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	88.4	71.0	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3576797)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	103	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3576424)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	99.8	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	95.0	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	75.3	63.0	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3576797)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	100	68.4	128
EP080: BTEXN (QCLot: 3576797)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	104	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	99.0	65.0	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	98.5	66.0	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	99.9	68.0	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	110	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**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3578659)							
ES2109679-005	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	88.6	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	83.8	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	102	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	99.9	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	84.2	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	118	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	90.0	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3578660)							
ES2109679-005	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	77.2	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3576424)							
ES2109679-001	Anonymous	EP071: C10 - C14 Fraction	----	523 mg/kg	90.2	73.0	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	106	53.0	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	97.2	52.0	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3576797)							
ES2109679-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	84.0	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3576424)							
ES2109679-001	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	94.4	73.0	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	98.1	53.0	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	97.9	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3576797)							
ES2109679-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	86.2	70.0	130
EP080: BTEXN (QCLot: 3576797)							
ES2109679-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	82.3	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	86.6	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	84.6	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	81.5	70.0	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	88.0	70.0	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	96.8	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2109750**	Page	: 1 of 4
Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR DAVID HOLDEN	Telephone	: +61 2 8784 8555
Project	: 86884.02 Haymarket contamination Investigation	Date Samples Received	: 18-Mar-2021
Site	: ----	Issue Date	: 24-Mar-2021
Sampler	: AS/IT	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

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							
Soil Glass Jar - Unpreserved (EA055)							
BD1/110321	**11-Mar-2021**	**----**	----	----	**22-Mar-2021**	25-Mar-2021	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
BD1/110321	**11-Mar-2021**	**22-Mar-2021**	07-Sep-2021	✓	**23-Mar-2021**	07-Sep-2021	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
BD1/110321	**11-Mar-2021**	**22-Mar-2021**	08-Apr-2021	✓	**24-Mar-2021**	08-Apr-2021	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
BD1/110321	**11-Mar-2021**	**22-Mar-2021**	25-Mar-2021	✓	**22-Mar-2021**	25-Mar-2021	✓
Soil Glass Jar - Unpreserved (EP071)							
BD1/110321	**11-Mar-2021**	**22-Mar-2021**	25-Mar-2021	✓	**23-Mar-2021**	01-May-2021	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080)							
BD1/110321	**11-Mar-2021**	**22-Mar-2021**	25-Mar-2021	✓	**22-Mar-2021**	25-Mar-2021	✓
Soil Glass Jar - Unpreserved (EP071)							
BD1/110321	**11-Mar-2021**	**22-Mar-2021**	25-Mar-2021	✓	**23-Mar-2021**	01-May-2021	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
BD1/110321	**11-Mar-2021**	**22-Mar-2021**	25-Mar-2021	✓	**22-Mar-2021**	25-Mar-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		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	19	**10.53**	**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	11	**18.18**	**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)							
Total Mercury by FIMS	EG035T	1	19	**5.26**	**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	11	**9.09**	**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)							
Total Mercury by FIMS	EG035T	1	19	**5.26**	**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	11	**9.09**	**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)							
Total Mercury by FIMS	EG035T	1	19	**5.26**	**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	11	**9.09**	**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 (SnCl2) (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 SnCl2 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	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).
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, Na2SO4 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 : **ES2109750**

Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR DAVID HOLDEN	Contact	: Sepan Mahamad
Address	: UNIT 1, 22 WALTHAM STREET	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: david.holden@douglaspartners.com.au	E-mail	: Sepan.Mahamad@ALSGlobal.com
Telephone	: +61 02 9809 0666	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 9809 4095	Facsimile	: +61-2-8784 8500
Project	: 86884.02 Haymarket contamination Investigation	Page	: 1 of 3
Order number	: ----	Quote number	: EM2017DOUPAR0002 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: AS/IT		

Dates

Date Samples Received	: 18-Mar-2021 15:30	Issue Date	: 19-Mar-2021
Client Requested Due Date	: 25-Mar-2021	Scheduled Reporting Date	: **25-Mar-2021**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 10.9
Receipt Detail	:	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- pH field/fox Analysis to be conducted by ALS Brisbane
- 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	SOIL - EA055-103 Moisture Content	SOIL - S-05 TRH/BTEXN/8 Metals
ES2109750-001	11-Mar-2021 00:00	BD1/110321	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS PAYABLE INVOICES

- A4 - AU Tax Invoice (INV)	Email	apinvoices@douglaspartners.com.au

ALYSSA SPENCER

- *AU Certificate of Analysis - NATA (COA)	Email	Alyssa.Spencer@douglaspartners.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	Alyssa.Spencer@douglaspartners.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	Alyssa.Spencer@douglaspartners.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	Alyssa.Spencer@douglaspartners.com
- A4 - AU Tax Invoice (INV)	Email	Alyssa.Spencer@douglaspartners.com
- Chain of Custody (CoC) (COC)	Email	Alyssa.Spencer@douglaspartners.com
- EDI Format - ENMRG (ENMRG)	Email	Alyssa.Spencer@douglaspartners.com
- EDI Format - ESDAT (ESDAT)	Email	Alyssa.Spencer@douglaspartners.com
- EDI Format - XTab (XTAB)	Email	Alyssa.Spencer@douglaspartners.com

DAVID HOLDEN

- *AU Certificate of Analysis - NATA (COA)	Email	david.holden@douglaspartners.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	david.holden@douglaspartners.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	david.holden@douglaspartners.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	david.holden@douglaspartners.com.au
- A4 - AU Tax Invoice (INV)	Email	david.holden@douglaspartners.com.au
- Chain of Custody (CoC) (COC)	Email	david.holden@douglaspartners.com.au
- EDI Format - ENMRG (ENMRG)	Email	david.holden@douglaspartners.com.au
- EDI Format - ESDAT (ESDAT)	Email	david.holden@douglaspartners.com.au
- EDI Format - XTab (XTAB)	Email	david.holden@douglaspartners.com.au

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	86884.02	**Suburb:**	Haymarket	**To:**	Envirolab Services
Project Name:	Haymarkert Contamination Investigation	**Order Number**			12 Ashley Street, Chatswood 2067
Project Manager:	David Holden	**Sampler:**	AS/IT	**Attn:**	Aileen Hie
Emails:	david.holden@douglaspartners.com.au alyssa.spencer@douglaspartners.com.au			**Phone:**	9910 6200
Date Required:	Std			**Email:**	ahie@envirolab.com.au
Prior Storage:	Esky/Fridge	Do samples contain 'potential' HBM?	Yes		

Sample ID	Lab ID	Date Sampled	Sample Type (S - soil W - water)	Container Type (G - glass P - plastic)	Analytes: Combo 8A	Combo 8	Combo 3a	Combo 3	500 AF/FA	ph and CEC	on hold			Notes/preservation
1001/0.25-0.3	1	12/03/21	S	G	x									
1001/0.5-0.6	2	12/03/21	S	G				x						
1001/0.9-1.0	3	12/03/21	S	G							x			
1002/0.25-0.35	4	11/03/21	S	G			x							
1002/0.35-0.5	5	11/03/21	S	G				x		x				
BD1/110321	6 (CW)	11/03/21	S	G				x						Please forward for interlab analysis (Combo 3 - metals, TRH, BTEX, PAH)
PQL (S) mg/kg														**ANZECC PQLs req'd for all water analytes** ☐

Environmental Division Sydney
Work Order Reference
ES2109750

Telephone : + 61-2-8784 8555

ENVIROLAB GROUP
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 264455
Date Received: 17/3/2021
Time Received: 12:50
Received By: S
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Lab Report/Reference No:

Metals to Analyse: 8HM unless specified here:

Total number of samples in container: 6 | **Relinquished by:** DIH | **Transported to laboratory by:** Bonds

Send Results to: Douglas Partners Pty Ltd | **Address** | **Phone:** | **Fax:**

Signed: DIH 17/3/21 10:45 | **Received by:** | **Date & Time:** 17/3/2021 1250

Relinquished by: EDS Syd 18/3/21 11:30

Rec. Sc 18/3/21 1530 10.9 C

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 264947

Client Details

Client	Douglas Partners Pty Ltd
Attention	David Holden
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**86884.02, Haymarket Contamination Investigation**
Number of Samples	10 Water
Date samples received	23/03/2021
Date completed instructions received	23/03/2021

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

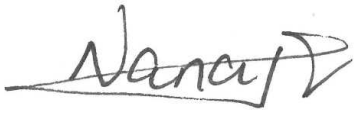
Date results requested by	30/03/2021
Date of Issue	30/03/2021

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Diego Bigolin, Team Leader, Inorganics
Dragana Tomas, Senior Chemist
Giovanni Agosti, Group Technical Manager
Greta Petzold, Senior Chemist
Ken Nguyen, Reporting Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

VOCs in water						
Our Reference		264947-1	264947-2	264947-3	264947-4	264947-5
Your Reference	UNITS	107A	107B	202	1002	1003A
Date Sampled		22/03/2021	22/03/2021	22/03/2021	22/03/2021	22/03/2021
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	25/03/2021	25/03/2021	25/03/2021	25/03/2021	25/03/2021
Date analysed	-	26/03/2021	26/03/2021	26/03/2021	26/03/2021	26/03/2021
Dichlorodifluoromethane	µg/L	<10	<10	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1	<1
Chloroform	µg/L	<1	<1	11	<1	6
2,2-dichloropropane	µg/L	<1	<1	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1
Benzene	µg/L	<1	<1	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1	2
1,3-dichloropropane	µg/L	<1	<1	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1

VOCs in water						
Our Reference		264947-1	264947-2	264947-3	264947-4	264947-5
Your Reference	UNITS	107A	107B	202	1002	1003A
Date Sampled		22/03/2021	22/03/2021	22/03/2021	22/03/2021	22/03/2021
Type of sample		Water	Water	Water	Water	Water
Bromoform	µg/L	<1	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2	<2
Styrene	µg/L	<1	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1	<1	<1
o-xylene	µg/L	<1	<1	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	<1	<1	<1
Tert-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	100	101	102	101	101
Surrogate toluene-d8	%	98	99	99	100	99
Surrogate 4-BFB	%	98	99	99	100	100

VOCs in water		
Our Reference		264947-6
Your Reference	UNITS	1007
Date Sampled		22/03/2021
Type of sample		Water
Date extracted	-	25/03/2021
Date analysed	-	26/03/2021
Dichlorodifluoromethane	µg/L	<10
Chloromethane	µg/L	<10
Vinyl Chloride	µg/L	<10
Bromomethane	µg/L	<10
Chloroethane	µg/L	<10
Trichlorofluoromethane	µg/L	<10
1,1-Dichloroethene	µg/L	<1
Trans-1,2-dichloroethene	µg/L	<1
1,1-dichloroethane	µg/L	<1
Cis-1,2-dichloroethene	µg/L	<1
Bromochloromethane	µg/L	<1
Chloroform	µg/L	4
2,2-dichloropropane	µg/L	<1
1,2-dichloroethane	µg/L	<1
1,1,1-trichloroethane	µg/L	<1
1,1-dichloropropene	µg/L	<1
Cyclohexane	µg/L	<1
Carbon tetrachloride	µg/L	<1
Benzene	µg/L	<1
Dibromomethane	µg/L	<1
1,2-dichloropropane	µg/L	<1
Trichloroethene	µg/L	<1
Bromodichloromethane	µg/L	<1
trans-1,3-dichloropropene	µg/L	<1
cis-1,3-dichloropropene	µg/L	<1
1,1,2-trichloroethane	µg/L	<1
Toluene	µg/L	<1
1,3-dichloropropane	µg/L	<1
Dibromochloromethane	µg/L	<1
1,2-dibromoethane	µg/L	<1
Tetrachloroethene	µg/L	<1
1,1,1,2-tetrachloroethane	µg/L	<1
Chlorobenzene	µg/L	<1
Ethylbenzene	µg/L	<1

VOCs in water		
Our Reference		264947-6
Your Reference	UNITS	1007
Date Sampled		22/03/2021
Type of sample		Water
Bromoform	µg/L	<1
m+p-xylene	µg/L	<2
Styrene	µg/L	<1
1,1,2,2-tetrachloroethane	µg/L	<1
o-xylene	µg/L	<1
1,2,3-trichloropropane	µg/L	<1
Isopropylbenzene	µg/L	<1
Bromobenzene	µg/L	<1
n-propyl benzene	µg/L	<1
2-chlorotoluene	µg/L	<1
4-chlorotoluene	µg/L	<1
1,3,5-trimethyl benzene	µg/L	<1
Tert-butyl benzene	µg/L	<1
1,2,4-trimethyl benzene	µg/L	<1
1,3-dichlorobenzene	µg/L	<1
Sec-butyl benzene	µg/L	<1
1,4-dichlorobenzene	µg/L	<1
4-isopropyl toluene	µg/L	<1
1,2-dichlorobenzene	µg/L	<1
n-butyl benzene	µg/L	<1
1,2-dibromo-3-chloropropane	µg/L	<1
1,2,4-trichlorobenzene	µg/L	<1
Hexachlorobutadiene	µg/L	<1
1,2,3-trichlorobenzene	µg/L	<1
Surrogate Dibromofluoromethane	%	100
Surrogate toluene-d8	%	97
Surrogate 4-BFB	%	99

vTRH(C6-C10)/BTEXN in Water						
Our Reference		264947-1	264947-2	264947-3	264947-4	264947-5
Your Reference	UNITS	107A	107B	202	1002	1003A
Date Sampled		22/03/2021	22/03/2021	22/03/2021	22/03/2021	22/03/2021
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	25/03/2021	25/03/2021	25/03/2021	25/03/2021	25/03/2021
Date analysed	-	26/03/2021	26/03/2021	26/03/2021	26/03/2021	26/03/2021
TRH C_6 - C_9	µg/L	<10	<10	<10	<10	<10
TRH C_6 - C_{10}	µg/L	<10	<10	<10	<10	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	<10	<10	<10
Benzene	µg/L	<1	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1	2
Ethylbenzene	µg/L	<1	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2	<2
o-xylene	µg/L	<1	<1	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	100	101	102	101	101
Surrogate toluene-d8	%	98	99	99	100	99
Surrogate 4-BFB	%	98	99	99	100	100

vTRH(C6-C10)/BTEXN in Water						
Our Reference		264947-6	264947-7	264947-8	264947-9	264947-10
Your Reference	UNITS	1007	BD1/230321	Trip Spike	Trip Blank	Rinsate
Date Sampled		22/03/2021	22/03/2021	22/03/2021	22/03/2021	23/03/2021
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	25/03/2021	25/03/2021	25/03/2021	25/03/2021	25/03/2021
Date analysed	-	26/03/2021	26/03/2021	26/03/2021	26/03/2021	26/03/2021
TRH C_6 - C_9	µg/L	<10	<10	[NA]	<10	29
TRH C_6 - C_{10}	µg/L	<10	<10	[NA]	<10	30
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	[NA]	<10	30
Benzene	µg/L	<1	<1	117%	<1	<1
Toluene	µg/L	<1	<1	115%	<1	<1
Ethylbenzene	µg/L	<1	<1	119%	<1	<1
m+p-xylene	µg/L	<2	<2	111%	<2	<2
o-xylene	µg/L	<1	<1	118%	<1	<1
Naphthalene	µg/L	<1	<1	[NA]	<1	<1
Surrogate Dibromofluoromethane	%	100	100	102	101	100
Surrogate toluene-d8	%	97	97	100	99	98
Surrogate 4-BFB	%	99	100	100	98	99

svTRH (C10-C40) in Water						
Our Reference		264947-1	264947-2	264947-3	264947-4	264947-5
Your Reference	UNITS	107A	107B	202	1002	1003A
Date Sampled		22/03/2021	22/03/2021	22/03/2021	22/03/2021	22/03/2021
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	24/03/2021	24/03/2021	24/03/2021	24/03/2021	24/03/2021
Date analysed	-	25/03/2021	25/03/2021	25/03/2021	25/03/2021	25/03/2021
TRH C_{10} - C_{14}	µg/L	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	120	<100	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100	<100	<100
TRH >C_{10} - C_{16}	µg/L	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	<50	<50	<50	<50
TRH >C_{16} - C_{34}	µg/L	<100	120	<100	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	86	84	96	106	103

svTRH (C10-C40) in Water			
Our Reference		264947-6	264947-7
Your Reference	UNITS	1007	BD1/230321
Date Sampled		22/03/2021	22/03/2021
Type of sample		Water	Water
Date extracted	-	24/03/2021	24/03/2021
Date analysed	-	25/03/2021	25/03/2021
TRH C_{10} - C_{14}	µg/L	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100
TRH >C_{10} - C_{16}	µg/L	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100
Surrogate o-Terphenyl	%	80	85

PAHs in Water - Low Level						
Our Reference		264947-1	264947-2	264947-3	264947-4	264947-5
Your Reference	UNITS	107A	107B	202	1002	1003A
Date Sampled		22/03/2021	22/03/2021	22/03/2021	22/03/2021	22/03/2021
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	24/03/2021	24/03/2021	24/03/2021	24/03/2021	24/03/2021
Date analysed	-	24/03/2021	24/03/2021	26/03/2021	26/03/2021	26/03/2021
Naphthalene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	87	95	70	73	84

PAHs in Water - Low Level			
Our Reference		264947-6	264947-7
Your Reference	UNITS	1007	BD1/230321
Date Sampled		22/03/2021	22/03/2021
Type of sample		Water	Water
Date extracted	-	24/03/2021	24/03/2021
Date analysed	-	24/03/2021	24/03/2021
Naphthalene	µg/L	<0.2	<0.2
Acenaphthylene	µg/L	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	80	87

OCPs in Water - Trace Level				
Our Reference	UNITS	264947-3	264947-4	264947-5
Your Reference		202	1002	1003A
Date Sampled		22/03/2021	22/03/2021	22/03/2021
Type of sample		Water	Water	Water
Date extracted	-	24/03/2021	24/03/2021	24/03/2021
Date analysed	-	26/03/2021	26/03/2021	26/03/2021
alpha-BHC	µg/L	<0.001	<0.001	<0.001
HCB	µg/L	<0.001	<0.001	<0.001
beta-BHC	µg/L	<0.001	<0.001	<0.001
gamma-BHC	µg/L	<0.001	<0.001	<0.001
Heptachlor	µg/L	<0.001	<0.001	<0.001
delta-BHC	µg/L	<0.001	<0.001	<0.001
Aldrin	µg/L	<0.001	<0.001	<0.001
Heptachlor Epoxide	µg/L	<0.001	<0.001	<0.001
gamma-Chlordane	µg/L	<0.001	<0.001	<0.001
alpha-Chlordane	µg/L	<0.001	<0.001	<0.001
Endosulfan I	µg/L	<0.002	<0.002	<0.002
pp-DDE	µg/L	<0.001	<0.001	<0.001
Dieldrin	µg/L	<0.001	<0.001	<0.001
Endrin	µg/L	<0.001	<0.001	<0.001
Endosulfan II	µg/L	<0.002	<0.002	<0.002
pp-DDD	µg/L	<0.001	<0.001	<0.001
Endrin Aldehyde	µg/L	<0.001	<0.001	<0.001
pp-DDT	µg/L	<0.001	<0.001	<0.001
Endosulfan Sulphate	µg/L	<0.001	<0.001	<0.001
Methoxychlor	µg/L	<0.001	<0.001	<0.001
Surrogate TCMX	%	64	68	70

OP in water Trace ANZECCF/ADWG				
Our Reference		264947-3	264947-4	264947-5
Your Reference	UNITS	202	1002	1003A
Date Sampled		22/03/2021	22/03/2021	22/03/2021
Type of sample		Water	Water	Water
Date extracted	-	24/03/2021	24/03/2021	24/03/2021
Date analysed	-	26/03/2021	26/03/2021	26/03/2021
Dichlorovos	µg/L	<0.2	<0.2	<0.2
Dimethoate	µg/L	<0.15	<0.15	<0.15
Diazinon	µg/L	<0.01	<0.01	<0.01
Chlorpyriphos-methyl	µg/L	<0.2	<0.2	<0.2
Methyl Parathion	µg/L	<0.2	<0.2	<0.2
Ronnel	µg/L	<0.2	<0.2	<0.2
Fenitrothion	µg/L	<0.2	<0.2	<0.2
Malathion	µg/L	<0.05	<0.05	<0.05
Chlorpyriphos	µg/L	<0.009	<0.009	<0.009
Parathion	µg/L	<0.004	<0.004	<0.004
Bromophos ethyl	µg/L	<0.2	<0.2	<0.2
Ethion	µg/L	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	µg/L	<0.02	<0.02	<0.02
Surrogate TCMX	%	64	68	70

PCBs in Water - Trace Level				
Our Reference		264947-3	264947-4	264947-5
Your Reference	UNITS	202	1002	1003A
Date Sampled		22/03/2021	22/03/2021	22/03/2021
Type of sample		Water	Water	Water
Date extracted	-	24/03/2021	24/03/2021	24/03/2021
Date analysed	-	26/03/2021	26/03/2021	26/03/2021
Aroclor 1016	µg/L	<0.01	<0.01	<0.01
Aroclor 1221	µg/L	<0.01	<0.01	<0.01
Aroclor 1232	µg/L	<0.01	<0.01	<0.01
Aroclor 1242	µg/L	<0.01	<0.01	<0.01
Aroclor 1248	µg/L	<0.01	<0.01	<0.01
Aroclor 1254	µg/L	<0.01	<0.01	<0.01
Aroclor 1260	µg/L	<0.01	<0.01	<0.01
Surrogate TCMX	%	64	68	70

Total Phenolics in Water						
Our Reference		264947-1	264947-2	264947-3	264947-4	264947-5
Your Reference	UNITS	107A	107B	202	1002	1003A
Date Sampled		22/03/2021	22/03/2021	22/03/2021	22/03/2021	22/03/2021
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	25/03/2021	25/03/2021	25/03/2021	25/03/2021	25/03/2021
Date analysed	-	25/03/2021	25/03/2021	25/03/2021	25/03/2021	25/03/2021
Total Phenolics (as Phenol)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05

Total Phenolics in Water			
Our Reference		264947-6	264947-7
Your Reference	UNITS	1007	BD1/230321
Date Sampled		22/03/2021	22/03/2021
Type of sample		Water	Water
Date extracted	-	25/03/2021	25/03/2021
Date analysed	-	25/03/2021	25/03/2021
Total Phenolics (as Phenol)	mg/L	<0.05	<0.05

HM in water - dissolved						
Our Reference		264947-1	264947-2	264947-3	264947-4	264947-5
Your Reference	UNITS	107A	107B	202	1002	1003A
Date Sampled		22/03/2021	22/03/2021	22/03/2021	22/03/2021	22/03/2021
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	25/03/2021	25/03/2021	25/03/2021	25/03/2021	25/03/2021
Date analysed	-	25/03/2021	25/03/2021	25/03/2021	25/03/2021	25/03/2021
Arsenic-Dissolved	µg/L	<1	<1	<1	<1	<1
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1	0.2	<0.1
Chromium-Dissolved	µg/L	<1	<1	<1	<1	<1
Copper-Dissolved	µg/L	<1	<1	<1	2	18
Lead-Dissolved	µg/L	<1	<1	<1	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	12	26	2	4	4
Zinc-Dissolved	µg/L	25	7	18	140	86
Iron-Dissolved	µg/L	78	<10	3,000	<10	12

HM in water - dissolved				
Our Reference		264947-6	264947-7	264947-10
Your Reference	UNITS	1007	BD1/230321	Rinsate
Date Sampled		22/03/2021	22/03/2021	23/03/2021
Type of sample		Water	Water	Water
Date prepared	-	25/03/2021	25/03/2021	25/03/2021
Date analysed	-	25/03/2021	25/03/2021	25/03/2021
Arsenic-Dissolved	µg/L	<1	<1	<1
Cadmium-Dissolved	µg/L	<0.1	0.2	<0.1
Chromium-Dissolved	µg/L	<1	<1	<1
Copper-Dissolved	µg/L	<1	2	2
Lead-Dissolved	µg/L	<1	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	3	4	1
Zinc-Dissolved	µg/L	110	140	5
Iron-Dissolved	µg/L	850	[NA]	[NA]

HM in water - total						
Our Reference		264947-1	264947-2	264947-3	264947-4	264947-5
Your Reference	UNITS	107A	107B	202	1002	1003A
Date Sampled		22/03/2021	22/03/2021	22/03/2021	22/03/2021	22/03/2021
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	25/03/2021	25/03/2021	25/03/2021	25/03/2021	25/03/2021
Date analysed	-	25/03/2021	25/03/2021	25/03/2021	25/03/2021	25/03/2021
Arsenic-Total	µg/L	2	7	2	6	1
Cadmium-Total	µg/L	0.8	0.2	<0.1	0.3	0.1
Chromium-Total	µg/L	12	41	4	20	21
Copper-Total	µg/L	13	38	5	37	31
Lead-Total	µg/L	13	38	5	45	13
Mercury-Total	µg/L	<0.05	0.09	<0.05	<0.05	<0.05
Nickel-Total	µg/L	18	100	4	17	8
Zinc-Total	µg/L	95	190	42	570	370
Iron-Total	µg/L	2,900	39,000	7,500	18,000	8,700

HM in water - total		
Our Reference		264947-6
Your Reference	UNITS	1007
Date Sampled		22/03/2021
Type of sample		Water
Date prepared	-	25/03/2021
Date analysed	-	25/03/2021
Arsenic-Total	µg/L	7
Cadmium-Total	µg/L	3.9
Chromium-Total	µg/L	57
Copper-Total	µg/L	110
Lead-Total	µg/L	81
Mercury-Total	µg/L	0.11
Nickel-Total	µg/L	38
Zinc-Total	µg/L	4,300
Iron-Total	µg/L	47,000

Cations in water Dissolved						
Our Reference		264947-1	264947-2	264947-3	264947-4	264947-5
Your Reference	UNITS	107A	107B	202	1002	1003A
Date Sampled		22/03/2021	22/03/2021	22/03/2021	22/03/2021	22/03/2021
Type of sample		Water	Water	Water	Water	Water
Date digested	-	26/03/2021	26/03/2021	26/03/2021	26/03/2021	26/03/2021
Date analysed	-	26/03/2021	26/03/2021	26/03/2021	26/03/2021	26/03/2021
Calcium - Dissolved	mg/L	16	22	7.7	23	24
Magnesium - Dissolved	mg/L	10	14	4.3	8.5	3.2
Hardness	mgCaCO 3 /L	82	110	37	93	72

Cations in water Dissolved		
Our Reference		264947-6
Your Reference	UNITS	1007
Date Sampled		22/03/2021
Type of sample		Water
Date digested	-	26/03/2021
Date analysed	-	26/03/2021
Calcium - Dissolved	mg/L	6.3
Magnesium - Dissolved	mg/L	9.7
Hardness	mgCaCO 3 /L	55

Miscellaneous Inorganics				
Our Reference		264947-3	264947-4	264947-5
Your Reference	UNITS	202	1002	1003A
Date Sampled		22/03/2021	22/03/2021	22/03/2021
Type of sample		Water	Water	Water
Date prepared	-	25/03/2021	25/03/2021	25/03/2021
Date analysed	-	25/03/2021	25/03/2021	25/03/2021
Total Cyanide	mg/L	<0.004	<0.004	<0.004

Method ID	Methodology Summary
Inorg-014	Cyanide - free, total, weak acid dissociable by segmented flow analyser (in line dialysis with colourimetric finish). Solids/Filters and sorbents are extracted in a caustic media prior to analysis. Impingers are pH adjusted as required prior to analysis. Cyanides amenable to Chlorination - samples are analysed untreated and treated with hyperchlorite to assess the potential for chlorination of cyanide forms. Based on APHA latest edition, 4500-CN_G,H.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

QUALITY CONTROL: VOCs in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			25/03/2021	5	25/03/2021	25/03/2021		25/03/2021	[NT]
Date analysed	-			26/03/2021	5	26/03/2021	26/03/2021		26/03/2021	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	5	<10	<10	0	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	5	<10	<10	0	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	5	<10	<10	0	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	5	<10	<10	0	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	5	<10	<10	0	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	5	<10	<10	0	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	5	<1	<1	0	110	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	5	6	6	0	112	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	5	<1	<1	0	108	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	5	<1	<1	0	111	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
Dibromomethane	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	5	<1	<1	0	120	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	5	<1	<1	0	111	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	5	2	2	0	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	5	<1	<1	0	109	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	5	<1	<1	0	110	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
Bromoform	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	5	<2	<2	0	[NT]	[NT]
Styrene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VOCs in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
o-xylene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	101	5	101	99	2	99	[NT]
Surrogate toluene-d8	%		Org-023	100	5	99	99	0	100	[NT]
Surrogate 4-BFB	%		Org-023	101	5	100	97	3	102	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			25/03/2021	5	25/03/2021	25/03/2021		25/03/2021	[NT]
Date analysed	-			26/03/2021	5	26/03/2021	26/03/2021		26/03/2021	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	5	<10	<10	0	115	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	5	<10	<10	0	115	[NT]
Benzene	µg/L	1	Org-023	<1	5	<1	<1	0	112	[NT]
Toluene	µg/L	1	Org-023	<1	5	2	2	0	110	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	5	<1	<1	0	117	[NT]
m+p-xylene	µg/L	2	Org-023	<2	5	<2	<2	0	118	[NT]
o-xylene	µg/L	1	Org-023	<1	5	<1	<1	0	118	[NT]
Naphthalene	µg/L	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	101	5	101	99	2	99	[NT]
Surrogate toluene-d8	%		Org-023	100	5	99	99	0	100	[NT]
Surrogate 4-BFB	%		Org-023	101	5	100	97	3	102	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W5	[NT]
Date extracted	-			24/03/2021	[NT]	[NT]	[NT]	[NT]	24/03/2021	[NT]
Date analysed	-			24/03/2021	[NT]	[NT]	[NT]	[NT]	24/03/2021	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	119	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	118	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	102	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	119	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	118	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	102	[NT]
Surrogate o-Terphenyl	%		Org-020	86	[NT]	[NT]	[NT]	[NT]	81	[NT]

QUALITY CONTROL: PAHs in Water - Low Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			24/03/2021	[NT]	[NT]	[NT]	[NT]	24/03/2021	[NT]
Date analysed	-			24/03/2021	[NT]	[NT]	[NT]	[NT]	24/03/2021	[NT]
Naphthalene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	70	[NT]
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	78	[NT]
Fluorene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	79	[NT]
Pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	73	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	92	[NT]	[NT]	[NT]	[NT]	95	[NT]

QUALITY CONTROL: OCPs in Water - Trace Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			24/03/2021	[NT]	[NT]	[NT]	[NT]	24/03/2021	[NT]
Date analysed	-			26/03/2021	[NT]	[NT]	[NT]	[NT]	26/03/2021	[NT]
alpha-BHC	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	110	[NT]
HCB	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	104	[NT]
gamma-BHC	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	122	[NT]
delta-BHC	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	108	[NT]
Heptachlor Epoxide	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	102	[NT]
gamma-Chlordane	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-Chlordane	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	µg/L	0.002	Org-022/025	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	126	[NT]
Dieldrin	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	92	[NT]
Endrin	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	108	[NT]
Endosulfan II	µg/L	0.002	Org-022/025	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	112	[NT]
Endrin Aldehyde	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	90	[NT]
Endosulfan Sulphate	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Methoxychlor	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	71	[NT]	[NT]	[NT]	[NT]	73	[NT]

QUALITY CONTROL: OP in water Trace ANZECCF/ADWG						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			24/03/2021	[NT]	[NT]	[NT]	[NT]	24/03/2021	[NT]
Date analysed	-			24/03/2021	[NT]	[NT]	[NT]	[NT]	24/03/2021	[NT]
Dichlorovos	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	90	[NT]
Dimethoate	µg/L	0.15	Org-022/025	<0.15	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	µg/L	0.01	Org-022/025	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyriphos-methyl	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Methyl Parathion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	114	[NT]
Fenitrothion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	90	[NT]
Malathion	µg/L	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	116	[NT]
Chlorpyriphos	µg/L	0.009	Org-022/025	<0.009	[NT]	[NT]	[NT]	[NT]	100	[NT]
Parathion	µg/L	0.004	Org-022/025	<0.004	[NT]	[NT]	[NT]	[NT]	90	[NT]
Bromophos ethyl	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	96	[NT]
Azinphos-methyl (Guthion)	µg/L	0.02	Org-022/025	<0.02	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	71	[NT]	[NT]	[NT]	[NT]	73	[NT]

QUALITY CONTROL: PCBs in Water - Trace Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			24/03/2021	[NT]	[NT]	[NT]	[NT]	24/03/2021	[NT]
Date analysed	-			24/03/2021	[NT]	[NT]	[NT]	[NT]	24/03/2021	[NT]
Aroclor 1016	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	95	[NT]
Aroclor 1260	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-021	71	[NT]	[NT]	[NT]	[NT]	73	[NT]

QUALITY CONTROL: Total Phenolics in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	264947-2
Date extracted	-			25/03/2021	1	25/03/2021	25/03/2021		25/03/2021	25/03/2021
Date analysed	-			25/03/2021	1	25/03/2021	25/03/2021		25/03/2021	25/03/2021
Total Phenolics (as Phenol)	mg/L	0.05	Inorg-031	<0.05	1	<0.05	<0.05	0	101	92

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	264947-2
Date prepared	-			25/03/2021	1	25/03/2021	25/03/2021		25/03/2021	25/03/2021
Date analysed	-			25/03/2021	1	25/03/2021	25/03/2021		25/03/2021	25/03/2021
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	101	100
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	<0.1	<0.1	0	97	98
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	97	95
Copper-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	100	95
Lead-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	96	89
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	105	104
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	12	13	8	103	101
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	25	30	18	102	103
Iron-Dissolved	µg/L	10	Metals-022	<10	1	78	78	0	100	104

QUALITY CONTROL: HM in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			25/03/2021	1	25/03/2021	25/03/2021		25/03/2021	[NT]
Date analysed	-			25/03/2021	1	25/03/2021	25/03/2021		25/03/2021	[NT]
Arsenic-Total	µg/L	1	Metals-022	<1	1	2	[NT]		104	[NT]
Cadmium-Total	µg/L	0.1	Metals-022	<0.1	1	0.8	[NT]		103	[NT]
Chromium-Total	µg/L	1	Metals-022	<1	1	12	[NT]		100	[NT]
Copper-Total	µg/L	1	Metals-022	<1	1	13	[NT]		102	[NT]
Lead-Total	µg/L	1	Metals-022	<1	1	13	[NT]		98	[NT]
Mercury-Total	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	105	[NT]
Nickel-Total	µg/L	1	Metals-022	<1	1	18	[NT]		105	[NT]
Zinc-Total	µg/L	1	Metals-022	<1	1	95	[NT]		108	[NT]
Iron-Total	µg/L	10	Metals-022	<10	1	2900	[NT]		105	[NT]

QUALITY CONTROL: Cations in water Dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	264947-2
Date digested	-			26/03/2021	1	26/03/2021	26/03/2021		26/03/2021	26/03/2021
Date analysed	-			26/03/2021	1	26/03/2021	26/03/2021		26/03/2021	26/03/2021
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	16	16	0	90	82
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	10	10	0	95	90
Hardness	mgCaCO 3 /L	3		[NT]	1	82	82	0	[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date prepared	-			25/03/2021	[NT]	[NT]	[NT]	[NT]	25/03/2021	[NT]
Date analysed	-			25/03/2021	[NT]	[NT]	[NT]	[NT]	25/03/2021	[NT]
Total Cyanide	mg/L	0.004	Inorg-014	<0.004	[NT]	[NT]	[NT]	[NT]	98	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Douglas Partners
Environment / Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

	84.02	**Suburb:**	Haymarket	**To:**	Envirolab Services
Project Name:	Haymarkert Contamination Investigation	**Order Number**			12 Ashley Street, Chatswood 2067
Project Manager:	David Holden	**Sampler:**	JB	**Attn:**	Aileen Hie
Emails:	david.holden@douglaspartners.com.au alyssa.spencer@douglaspartners.com.au			**Phone:**	9910 6200
Date Required:	Std			**Email:**	ahie@envirolab.com.au
Prior Storage:	Esky/Fridge	Do samples contain 'potential' HBM?	No		

Sample ID	Lab ID	Date Sampled	Sample Type (S - soil W - water)	Container Type (G - glass P - plastic)	Analytes: Combo 4L	VOC	Metals (total)	iron (total & dissolved)	Trace OCP/OPP PCB	Cyanide	Hardness	TRH/BTEX		Notes/preservation
107A	1	22/03/21	w	G/P	x	x	x	x			x			
107B	2	22/03/21	w	G/P	x	x	x	x			x			
202	3	22/03/21	w	G/P	x	x	x	x	x	x	x			
1002	4	22/03/21	w	G/P	x	x	x	x	x	x	x			
1003A	5	22/03/21	w	G/P	x	x	x	x	x	x	x			
1007	6	22/03/21	w	G/P	x	x	x	x			x			
BD1/230321	7	22/03/21	w	G/P	x									
Trip Spike	8	22/03/21	w	G/P								x		
Trip Blank	9	22/03/21	w	G/P								x		
Rinsate	10	23/03/21	w											
PQL (S) mg/kg														**ANZECC PQLs req'd for all water analytes** ☐

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 264947
Date Received: 23/03/21
Time Received: 13:40
Received By: AW
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Metals to Analyse: 8HM unless specified here:

Lab Report/Reference No: 264947

Total number of samples in container: 6 **Relinquished by:** DIH **Transported to laboratory by:** Bonds

Send Results to: Douglas Partners Pty Ltd **Address:** **Phone:** **Fax:**

Signed: DIH 23/3/21 10:45 **Received by:** Envirolab AW **Date & Time:** 23/03/21 13:40

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd
Attention	David Holden

Sample Login Details

Your reference	86884.02, Haymarket Contamination Investigation
Envirolab Reference	264947
Date Sample Received	23/03/2021
Date Instructions Received	23/03/2021
Date Results Expected to be Reported	30/03/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	10 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	13.6
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	VOCs in water	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHs in Water - Low Level	OCPs in Water - Trace Level	OP in water Trace ANZECCF/ADWG	PCBs in Water - Trace Level	Total Phenolics in Water	HM in water - dissolved	HM in water - total	Cations in water Dissolved	Total Cyanide
107A	✓	✓	✓	✓				✓	✓	✓	✓	
107B	✓	✓	✓	✓				✓	✓	✓	✓	
202	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
1002	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
1003A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
1007	✓	✓	✓	✓				✓	✓	✓	✓	
BD1/230321		✓	✓	✓				✓	✓			
Trip Spike		✓										
Trip Blank		✓										
Rinsate		✓							✓			

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

TAT for Micro is dependent on incubation. This varies from 3 to 6 days.