DETAILED SITE CONTAMINATION INVESTIGATION

PROPOSED RSL CLUB REDEVELOPMENT
20 - 22 MELWOOD AVENUE, FORESTVILLE NSW

PREPARED FOR THE FORESTVILLE RSL CLUB LIMITED
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Forestville RSL Club Limited
20 Melwood Avenue
Forestville NSW

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EXECUTIVE SUMMARY

GEE was commissioned the Forestville RSL Club Limited to undertake a Detailed Site (contamination) Investigation (PSI) for 20 - 22 Melwood Avenue, Forestville NSW 2087 (herein referred to as the 'site'). The site covers an area of approximately 8,970m^2 (by calculation) and encompasses the following legal allotments:

◊ Lot 31 Deposited Plan (DP) 366454 (No. 20 Melwood Ave)

◊ No. 22: Lot 2589 DP 752038 (No. 22 Melwood Ave)

The DSI supplements an earlier Preliminary Site Investigation (PSI) which was completed by GEE in 2024 and both investigations relate to the proposed redevelopment of the Forestville RSL Club which will also include the construction of a senior's living development on the site. Currently the site is occupied by an RSL Club building and memorial garden in the central portion of the site, car parking on the northern portion of the site, and disused bowling greens in the southern portion of the site.

The objectives of the PSI and DSI were to:

◊ Address the requirements of the State Environmental Planning Policy (Resilience and Hazards) 2021 (Reference 2),

◊ Assess the suitability of the site for the proposed residential land use,

◊ Identify any potential environmental constraints, and

◊ Support the Development Application to Northern Beaches Council.

The DSI investigation comprised a:

◊ Review of the previous PSI report,

◊ A detailed site inspection for potential sources of contamination,

◊ Preparation of an initial Conceptual Site Model (CSM),

◊ Field investigations including:

  - The drilling and logging of nineteen boreholes (BH201 and BH219) across the site which complement the previous two boreholes (BH101 and BH102), and
  - Sampling of soil from the boreholes.

◊ Laboratory analysis of selected soil samples for Chemicals of Potential Concern (CoPC).

The previous PSI revealed evidence of some potential aeras of potential contamination from past activities on the site. Specifically:

Onsite Areas and Sources of Potential Contamination	
Entire Site. In Particular the south-eastern half.	Fill Material: There exists some fill material (i.e. either imported soil material or previously disturbed soil) beneath the site. If imported to site, and sourced from an unknown location, the quality of fill material is also unknown and potentially contaminated.
Vehicle Accessible Areas / Carparks (particularly the northern carpark)	Past and Present Vehicle Movements: Vehicles accessing and parking on site may have resulted in leaks and spillage of fuel and oils.
Entire Site	Use of Lead based Paint and Asbestos Containing Materials (ACM) on existing and former structures: Any renovations or maintenance work over the years, or the demolition of former structures, may have resulted in near surface soil being impacted with lead and asbestos.
Bowling Greens (Southern Portion of Site)	Application of Fertilisers and Herbicides for Bowling Green Maintenance: As part of the maintenance and upkeep of the bowling greens, fertiliser and/or herbicide application may have resulted in near surface soils and potentially underlying soils being impacted with pesticides and to a lesser extent metals.
Areas of Current and Past Storage of Chemicals. (i.e. Greenkeepers shed, Fire Response System Shed & Storage Room in the north-west corner of the RSL Club)	Minor Storage of Chemicals: This may have resulted in top-down contamination from leaking or spilt chemicals. However, the concrete floor slab in these areas is likely to have restricted any migration of the chemicals.
Off-Site Areas and Sources of Potential Contamination	
-	-

The potential for contamination is from to-down sources and therefore the potential contaminated media comprises the near surface soil profile (either fill and/or natural soil). Groundwater is unlikely to be contaminated, although it has been assessed as part of this investigation. Soil Vapour is also unlikely to be contaminated but should be assessed if significant volatile contamination is encountered in the soil and/or groundwater.

Based on the proposed development, the potential receptors to any contamination (if present) include:

- ◊ Workers (adults) engaged to construct the proposed development including earthworks contractors for the basement,
- ◊ Existing users of the site (adults and children),
- ◊ Future occupants and visitors of the new development (adults and children), and
- ◊ Workers (adults) engaged to maintain any buried services/utilities.

Furthermore, the potential exposure pathways include:

- ◊ Ingestion of soil (workers) during redevelopment of the site.
- ◊ Ingestion of soil (adults and children) during future use of the site.
- ◊ Direct (dermal) contact for future users of the site (via any unsealed / deep soil areas).
- ◊ Direct (dermal) contact for workers (adults) engaged to construct the proposed development or maintain any buried services/utilities.
- ◊ Inhalation of any volatile contaminants (if present).
- ◊ Inhalation of asbestos fibres from degraded ACM (if present).

Based on:

- ◊ Field observations made during site works,
- ◊ The results of the sampling and laboratory analysis,
- ◊ The proposed land use, and
- ◊ Applicable statutory guidelines,

GEE concludes that the site is not currently suitable for the proposed development due to the detection of asbestos fibres bonded to matted material in one location (BH215) within the northern carpark. This material poses a potential health risk to construction workers, particularly during earthworks associated with the proposed Stage 2 redevelopment.

Despite this, the asbestos impacted soil, the site can be made suitable for the proposed development by undertaking convention management and/or remediation measures which GEE recommends that this is completed during proposed demolition works along with some delineation of the extent of the asbestos impacted soil. Finally, in accordance with State and local planning guidelines, a Remedial Action Plan (RAP) will be required to detail the proposed remediation methodology.

1 PROJECT INFORMATION

1.1 INTRODUCTION AND OBJECTIVES

Geo-Environmental Engineering (GEE) was commissioned by the Forestville RSL Club to undertake a Detailed Site (contamination) Investigation (PSI) for 20 - 22 Melwood Avenue, Forestville NSW 2087 (herein referred to as the 'site'). The site covers an area of approximately 8,970m^2 (by calculation) and encompasses the following legal allotments:

- ◊ Lot 31 Deposited Plan (DP) 366454 (No. 20 Melwood Ave).
- ◊ No. 22: Lot 2589 DP 752038 (No. 22 Melwood Ave).

A site location map is provided as **Figure 1**.

The DSI supplements an earlier Preliminary Site Investigation (PSI) completed by GEE in 2024 (reference 1). Both investigations support the proposed redevelopment of the Forestville RSL Club, which includes a seniors' living development. Architectural and survey plans are provided in **Appendix A**. The site currently comprises the existing RSL Club building and a memorial garden located centrally to the site, an on-grade car park to the north, and disused bowling greens to the south.

The objective of the DSI, and the previous PSI, was to address the requirements of the *State Environmental Planning Policy (Resilience and Hazards) 2021* (reference 2) by determining the suitability of the site for the proposed land-use and possible constraints on the proposed development. It was also required to support a Development Application with the Northern Beaches Council.

The DSI has been prepared in accordance with the NSW Environment Protection Authority (NSW EPA) *Contaminated Land Guidelines: Consultants Reporting on Contaminated Land* (reference 1) and NEPM (2013) Schedule B(2) *Guideline on Site Characterisation* (reference 2).

1.2 PREVIOUS INVESTIGATIONS

1.2.1 PSI

In May 2025, GEE completed a PSI for the site (reference 1) with the aim of identifying past and present contaminating activities, potential contamination types and to assess the need for further investigation. The scope of works for the PSI included:

- ◊ A review of the history of the site using available records including historical land titles and historical aerial photographs,

- ◊ A review of the site condition and environmental setting,
- ◊ A detailed site inspection for potential sources of contamination,
- ◊ Preparation of an initial Conceptual Site Model (CSM) to address potential areas of environmental concern (AEC), associated contaminants of potential concern (CoPC), transport mechanisms/pathways and potential receptors.
- ◊ A preliminary field investigation including:
  - The drilling of two boreholes (BH101 and BH102) across the southern portion of the site which was also undertaken as part of the concurrent geotechnical investigation (reference),
  - The installation of a groundwater well in both boreholes, which complements the previous well (BH1) installed as part of a former geotechnical investigation by JK Geotechnics (reference 5),
  - Sampling of soil from the two boreholes, and
  - The collection of a groundwater sample from the newly installed wells and the pre-existing well.
- ◊ Laboratory analysis of selected soil samples for a broad suite of potential contaminants of concern (CoPC), and
- ◊ Laboratory analysis of the groundwater samples for CoPC.

A summary of the site's history is provided in Section 3, while the summary of the site condition and surrounding environmental is reiterated in Section 4. A copy of the borehole logs are provided for reference in **Appendix B**, while the location of the boreholes are shown on **Figure 2** along with an extract of the survey plan, and **Figure 3** along with a recent aerial photograph.

In summary, the PSI identified the potential for contamination from shallow, surface-based sources, particularly in fill and natural soils. Groundwater and soil vapour were considered unlikely to be impacted but were assessed as part of the investigation. No significant contamination was detected in soil or groundwater; however, not all AECs were addressed. As a result, GEE recommended a DSI be undertaken in accordance with NSW EPA and NEPM (2013) guidelines.

1.2.2 JK Geotechnical Investigation

In 2023 JK Geotechnics Pty Ltd completed a geotechnical report for the site which was associated with an earlier version of the proposed Club redevelopment (reference 6). The

geotechnical investigation does not provide any specific information about site contamination. However, it included the drilling of three boreholes (BH1 to BH3) across the southern part of the site which provide preliminary information on the subsurface conditions across the site and potential adverse aesthetics. The investigation also included the installation of a groundwater monitoring well within one of the boreholes (i.e. BH1) which was used to assess groundwater quality as part of our PSI.

The information from these boreholes and well have been incorporated into our summary of the subsurface conditions across the site, while the borehole logs are also provided in **Appendix B**. The approximate locations of these boreholes are also shown on **Figure 2** which includes an extract of the survey plan, and **Figure 3**, which includes a recent aerial photograph.

1.3 PROPOSED DEVELOPMENT

Based on the architectural plans provided in **Appendix A**, it is proposed to construct the proposed development in two stages.

The first stage of the development (Stage 1) will comprise:

◊ The construction of a new RSL Club and seniors living apartments at the southern end of the site where the existing Bowling Greens are located. The new development will comprise three levels above ground with the RSL Club at ground level and the seniors living apartments occupying the upper two levels. There will also be three basement levels for parking and general storage. During this stage of works the existing Club and the open-air parking area to the north will be retained and remain operational.

The second stage of the development (Stage 2) will comprise:

◊ The demolition of the existing Club and associated carparking area in the northern part of the site, followed by the construction of a seniors living apartment building which will comprise three, three-level buildings over a two-level basement for parking that will ultimately integrate with the upper two basement levels from the Stage 1 works.

The approximate outline of each stage of the basements are indicated on the attached **Figure 2** which includes an extract of the survey plan, and **Figure 3**, which includes a recent aerial photograph.

The southern basement is proposed to extend up to the western boundary and will be within proximity (~1 metre) of the existing Club building to the north and the southern

boundary. It will also be setback approximately 9.0 metres from the eastern boundary, although there will be an access ramp in the south-eastern corner that will extend up to the eastern boundary and beyond to connect with Melwood Avenue. The lowest of the southern basement levels is proposed to have a Finished Floor Level of between 117.7 metres AHD. Based on existing surface elevations, GEE expects that excavation of between approximately 8.5 to 9.5 metres depth will be required with deeper excavations are also expected to be required locally to accommodate the proposed lift shafts.

The northern, two-level basement is proposed to be setback approximately 8.0 metres from the western boundary, 9.0 metres from the eastern boundary and at least 7m from the northern boundary. The lowest basement level will have a FFL of 120.7 metres above Australian Height Datum (AHD) and therefore GEE expects that excavation of between approximately 7.0 to 7.5 metres depth will be required.

GEE understands that both basements, where possible, will be 'drained' basement meaning that groundwater will be allowed to seep into the basement before being directed to a sump and then pumped out to the regional stormwater system.

1.4 Scope of Work

The scope of works completed by GEE, to achieve the above objectives, is provided below:

- Review of the previous PSI report,
- A detailed site inspection for potential sources of contamination,
- Preparation of an initial Conceptual Site Model (CSM),
- Field investigations including:
  - The drilling and logging of nineteen boreholes (BH201 and BH219) across the site which complement the previous two boreholes (BH101 and BH102), and
  - Sampling of soil from the boreholes.
- Laboratory analysis of selected soil samples for Chemicals of Potential Concern (CoPC), and
- Preparation of this report including the comparison of all the laboratory analytical results from this investigation and the previous PSI against relevant NSW Environment Protection Authority (EPA) endorsed guidelines.

2 SITE IDENTIFICATION

A summary of the site identification details is provided below, while a site location map is provided as **Figure 1**:

Street Address:	20 - 22 Melwood Avenue, Forestville NSW 2087
Legal Description:	No. 20: Lot 2589 in Deposited Plan DP 752038
	No. 22: Lot 31 in Deposited Plan DP 366454
Coordinates (MGA 56):	-33.762765 Lat., 151.210648 Long
Local Government Area:	Northern Beaches Council
Site Area:	8,790m^2 (approximately)
Current Zoning:	R2 – Low Density Residential[1]
Current Use:	Commercial / Retail
Proposed Zoning:	R2 – Low Density Residential
Proposed Use:	Mixed (Commercial/Retail and Residential)

[1] Warringah Local Environmental Plan 2011

3 SITE HISTORY

The site's history was researched by GEE as part of the PSI (reference 1). A summary of the site's history and the history of the surrounding lands is provided below:

3.1.1 The Site

The site was originally part of a larger parcel of land that was originally Crown Land, comprising bushland / scrubland.

Initial development of the site occurred between 1943 and 1951 when the northern allotment (Lot 31) was cleared of vegetation and a house was constructed at the eastern end of this allotment.

In 1957 the Forestville RSL Sub- branch acquired the southern allotment (Lot 2589) via a long-term lease before clearing the bushland and soon thereafter they constructed the first RSL Club building in the centre of this allotment. The two bowling greens at the southern end of the site were also constructed at this time along with the existing memorial garden in the front (east) of the Club building. The northern part of this allotment was converted into a carpark.

Between 1961 and 1965, a tennis court was constructed between the Club building and the western boundary.

Between 1965 and 1970, the main club building was either replaced or significantly renovated, with several more alterations and additions to the Club building occurring up until 2005, including the removal of the tennis court and upgrade of the northern parking are into the existing asphalt paved car park.

Between 1994 and 2005, the RSL Club acquired the northern allotment (Lot 31) and subsequently demolished the former house and expanded their carpark across this allotment.

From 2005, there were no significant changes to the site and its layout.

In summary, the historical site activities are considered to be relatively benign from a land contamination perspective. However, the age of the original house in the northern part of the site, and the original RSL Club building, suggests that Asbestos Containing Material (ACM) and lead based paints may have been used. Therefore, any renovations,

maintenance, or the demolition of these structures, may have resulted in near surface soils being impacted with lead and/or ACM.

3.1.2 Surrounding Land

The surrounding land within 150m of the site was tree covered bushland / scrubland, with some agricultural land further to the east, until 1951 when the early stages of development of Forestville began. Between 1951 and 1961 the surrounding area quickly transitioned into low density residential dwellings with recreational parkland and a school nearby, as returned soldiers started to populate the area and assisted with construction of the houses.

The historical business directories noted some former businesses within proximity of the site which are often related to site contamination and have the potential to cause chemical contamination beyond their boundaries via groundwater or vapour migration. This included a number of service stations and dry cleaners within 400m of the site. However, the location of these businesses and distances relative to the site suggest that any contamination from these properties are unlikely to have impacted the site.

4 SITE CONDITION AND SURROUNDING ENVIRONMENT

This section of the report provides a detailed description of the physical and environmental setting of the site, including a description of the site and the presence of any visible signs of contamination.

4.1 SITE DESCRIPTION

The site is bounded by Melwood Avenue to the east (beyond which is a low-density residential development), a low to medium density residential development to the north, and to the west is Forestville Dog Park, Forestville Community Hall and Forestville Scouts Hall. To the south the site is bounded by Forestville War Memorial Playing Fields, which comprise the ANZAC Memorial Pathway, Poppy Park Memorial playground and BBQ area, Forest Rugby Club, Forest Killarney Football Club (Melwood Oval), the associated carparks and several sports fields / courts.

The two-storey Forestville RSL Club building is located centrally to the site and is bounded by an open-air, asphalt paved carpark to the north, two bowling greens to the south (making up the entire southern portion of the site), and a war memorial garden to the east (between the club building and Melwood Avenue). The lower level of the club building interior comprised the gaming room, dining areas, kitchen, bars in the main area (accessible to customers), various staff rooms and storage rooms (some utilised for minor storage of cleaning/industrial chemicals), the loading dock and the cooler room in the back area. On the upper level were mixed-use rooms, including a board room, function rooms, a snooker room and offices. Neither of the bowling greens were being utilised (or maintained) for lawn bowling, and half of the bowling green on the western side had been converted into an alfresco dining area.

Near the bowling greens, and attached to the rear south-western corner of the RSL Club building, was the green keepers shed. The shed was being utilised for storage of maintenance equipment, outdoor furniture/décor and minor storage of chemicals (including paint/lacquer and turpentine). Adjacent to the eastern border (between the main entrance driveway and the memorial garden) was a small shed containing pumps relating to fire response systems. This fire response pump shed was concurrently being utilised for minor storage of fertiliser (dynamic lifter) and fuel in jerry cans (which presented a moderate hydrocarbon odour).

Based on the regional topography and the site inspection there is potential for fill material to have been introduced to site to raise the site surface or create a level platform for the

existing buildings and the bowling greens in the southern portion of the site. This is supported by the fact that the former geotechnical boreholes by JK Geotechnics Pty Ltd (reference 3), adjacent to the bowling greens, did encounter some fill material ranging in depth from 0.7m to 1.65m (**Appendix B**).

Aside from the moderate hydrocarbon odour noted within the fire response pump shed, there were no other unusual odours or surface staining that could be potentially associated with contamination. There was no evidence of under-ground or above-ground, fuel or chemical, storage tanks observed across the site. Building demolition was observed within the garden bed adjacent to the back fence at the southern end of the site (which presents potential asbestos contamination), otherwise, there was no obvious evidence of Asbestos Containing Materials (ACM) on the surface of the site.

Photographs of the site are provided for reference in Plates 1 to 15.



Plate 1 – View towards the west showing the front entrance of the RSL Club (the central portion of the site).



Plate 2 – View towards the south-west showing the bowling greens (the southern portion of the site).



Plate 3 – View towards the north-east showing the back of the RSL Club.



Plate 4 – View to the north-west showing the memorial garden and fire response pump shed to the right.



Plate 5 – View to the south-west showing the alfresco area within the former bowling green.



Plate 6 – View to the north-east, showing the garden bed and fill batter at the southern end of the site.



Plate 7 – Fill containing building demolition observed in the garden bed at the southern end of the site.



Plate 8 – View of the interior of the green keeper shed attached to the rear, south-western corner of the Club building. Location of Borehole BH210.

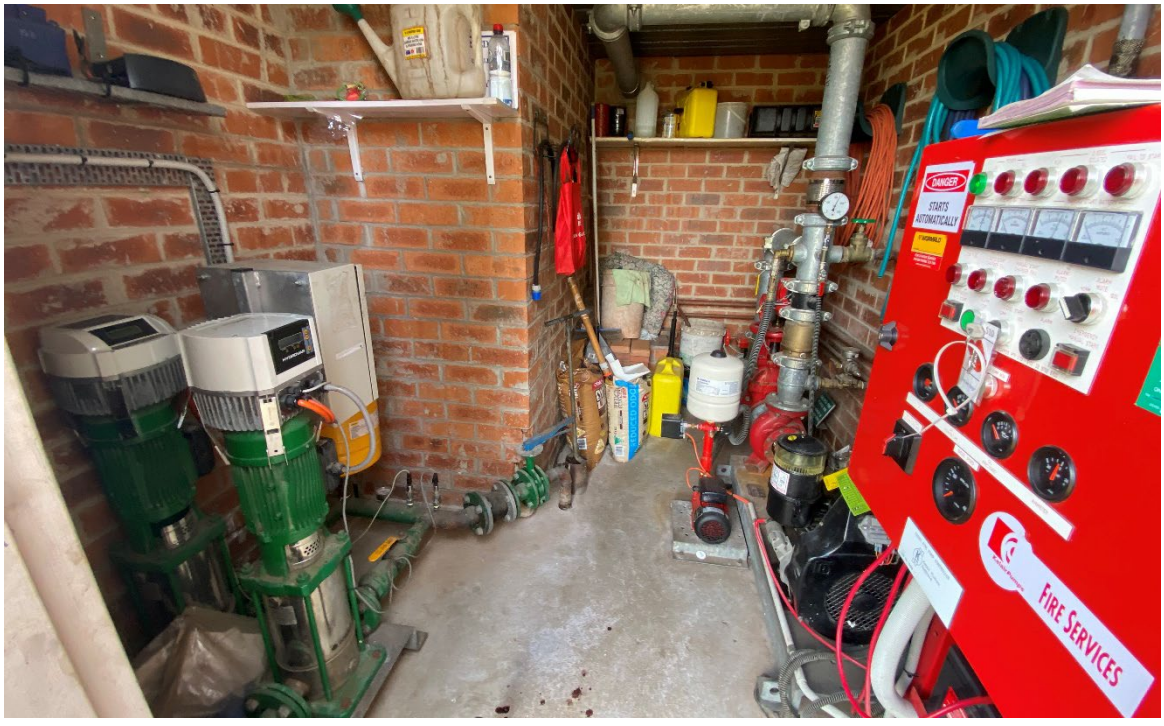


Plate 9 – View of the interior of the fire services pump shed.

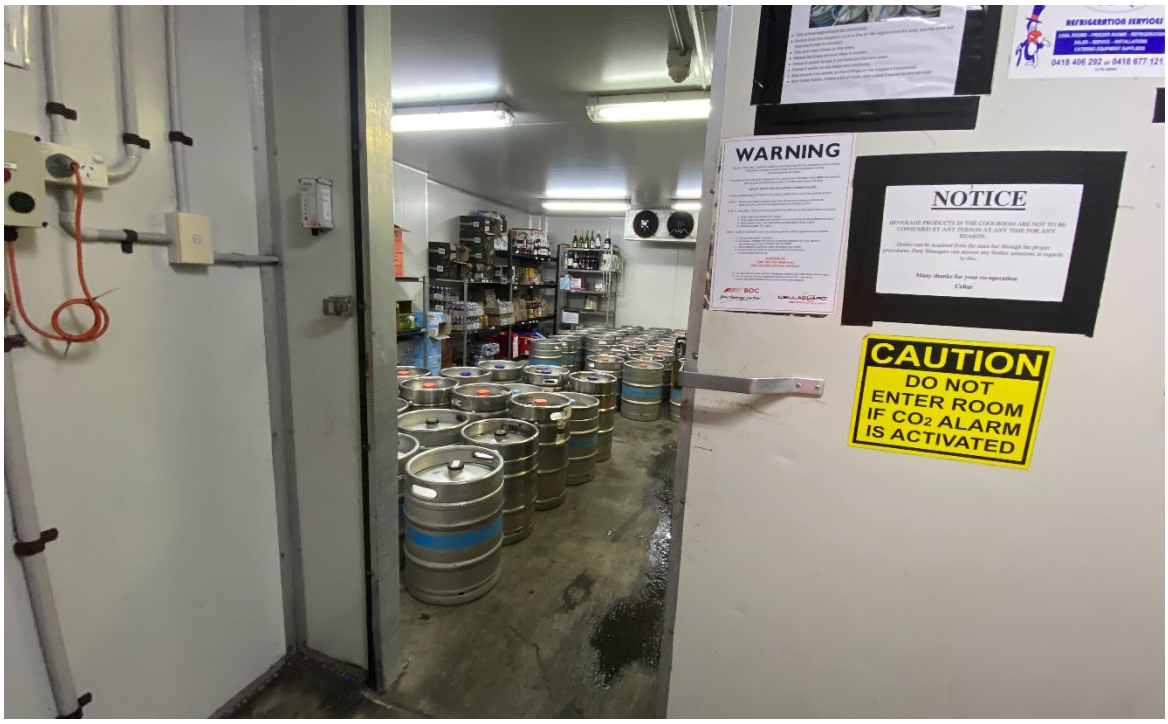


Plate 10 – View of the cooler room.



Plate 11 – View of a staff access corridor at the rear of the RSL and near the loading dock. Location of Borehole BH202.



Plate 12 – Historical image on display within the upper level of the RSL Club Building (c1960), showing the former RSL Club building (known at the time as Forestville RSL Sub- Branch Club) shortly after the establishment of the Forestville RSL Club.



Plate 13 – View to the south, showing the low cut into the natural hillslope supported by a mortared brick retaining wall.



Plate 14 – Location of Borehole BH215 in the carpark.



Plate 15 – Location of Borehole BH203 inside the staff service room of the RSL club. The concrete was directly underlain by sandstone bedrock.

4.2 Surrounding Land Uses and Activities

Surrounding land uses observed from the aerial photographs and our site inspection are predominately low-density and medium-density residential dwellings, open-space and community engagement.

4.3 Topography

Our site inspection revealed that the site is located on a hilltop and has an overall fall of about 1° to 2° down to the south-east. A review of the survey plan (**Appendix A**) indicates that the site surface elevation is approximately 127.8m AHD at the northern end of the site and falls to approximately 126m AHD in the south-eastern corner.

4.4 Regional Geology and Soils

A review of the regional geological map (reference 5) indicates that the site is underlain by the Triassic aged Hawkesbury Sandstone Formation. The Hawkesbury Sandstone Formation typically comprises "*…Medium to coarse-grained quartz sandstone, very minor shale and laminite lenses*".

A review of the regional soils map indicates that the site is located within the Lucas Heights Soil Landscape Group (reference 6), recognised by gently undulating crests and ridges on plateau surfaces. Local reliefs are generally up to 30m, slopes typically less than 10% in gradient. Soils of the Lucas Heights Group typically comprise residual sands and clays, are often stony and have low soil fertility.

Site specific geological and soil conditions encountered across the site are provided in Section 6.1.2 and incorporates any the relevant information from the former geotechnical and our recent boreholes.

4.5 Groundwater / Hydrogeology

4.5.1 Regional

Based on the geological information it was anticipated that the regional and permanent groundwater in the vicinity of the site is likely to be confined, or partly confined, within discrete water-bearing zones within the bedrock formation. However, intermittent 'perched' water seepage is likely to occur at the soil-bedrock interface following heavy and prolonged rainfall events.

A search of registered groundwater bores within 2km of the site was completed as part of the PSI and there are 31 registered bores within 2km of the site. The closest bore (GW109140) located 299m to the south-west of the site. This bore is a 210m deep unknown bore drilled on the 4th of August 2008, with a measured standing water level of 108 m below ground level, a salinity of 340 mg/L (indicating this groundwater bore produces fresh water), and a yield of 0.3 L/s.

A review of the bore information does not provide any useful information about specific groundwater levels beneath the site.

4.5.2 Site Specific

5 CONCEPTUAL SITE MODEL

The conceptual site model (CSM) is a representation, or summary, of information obtained regarding potential contamination sources, receptors and exposure pathways between the sources and receptors. The key elements of a CSM include:

- ◊ known and potential sources of contamination, areas of environmental concern (AEC) and chemicals of potential concern (CoPC), including the mechanisms of contamination (such as 'top down' spills or sub-surface releases from corroded tanks or pipes),
- ◊ potentially affected media (such as soil, sediment, groundwater, surface water, indoor and ambient air),
- ◊ human and ecological receptors, and
- ◊ potential and complete exposure pathways.

GEE notes that this CSM is based on existing information and will require revision once more information is obtained.

5.1 POTENTIAL CONTAMINATION SOURCES AND COPC

Based on the site history information, a review of the site's physical and environmental setting, and the results of the previous field investigations, the areas of environmental concern (AEC), potential for contamination and CoPC are summarised in **Table 1**.

Table 1: Potential Contamination Sources and CoPC

Area of Environmental Concern (AEC)	Potential Contaminating Source	Chemical of Potential Concern (CoPC)	Estimated Risk of Contamination
On-Site			
Entire Site. In Particular the south-eastern half.	Fill Material: There exists some fill material (i.e. either imported soil material or previously disturbed soil) beneath the site. If imported to site, and sourced from an unknown location, the quality of fill material is also unknown and potentially contaminated.	Metals, Polycyclic Aromatic Hydrocarbons (PAHs), Total Recoverable Hydrocarbons (TRH), Benzene, Toluene, Ethylbenzene, Xylene and Naphthalene (BTEXN), Pesticides, PCBs and Asbestos[2]	Medium
Vehicle Accessible Areas / Carparks (particularly the northern carpark)	Past and Present Vehicle Movements: Vehicles accessing and parking on site may have resulted in leaks and spillage of fuel and oils.	TRH, BTEXN, Lead and PAHs	Low
Entire Site	Use of Lead based Paint and Asbestos Containing Materials (ACM) on existing and former structures: Any renovations or maintenance work over the years, or the demolition of former structures, may have resulted in near surface soil being impacted with lead and asbestos.	Lead and Asbestos	Medium
Bowling Greens (Southern Portion of Site)	Application of Fertilisers and Herbicides for Bowling Green Maintenance: As part of the maintenance and upkeep of the bowling greens, fertiliser and/or herbicide application may have resulted in near surface soils and potentially underlying soils being impacted with pesticides and to a lesser extent metals.	Pesticides, Metals	Medium
Areas of Current and Past Storage of Chemicals. (i.e. Greenkeepers shed, Fire Response System Shed & Storage Room in the north-west corner of the RSL Club)	Minor Storage of Chemicals: This may have resulted in top-down contamination from leaking or spilt chemicals. However, the concrete floor slab in these areas is likely to have restricted any migration of the chemicals.	TRH, BTEXN, Metals, OCPs, PAHs and VOCs.	Low

[2] These are common contaminants of concern for developed areas across Sydney.

Off-Site			
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5.2 Potential or Known Contaminated Media

The potential for contamination on site is from top-down sources and therefore the potential contaminated media is the near surface soils and any fill material across the site. To a lesser extent is the deeper soil profile because there is always potential for contaminants to leach down through the soil.

Based on our PSI, groundwater is not contaminated. Soil Vapour is also unlikely to be contaminated but should be assessed if significant volatile contamination is encountered in the soil and/or groundwater.

5.3 Contaminant Receptors

Considering the existing land-uses and the fact that the proposed development will cover most of the site, potential receptors to the any contamination would include:

- ◊ Workers (adults) engaged to construct the proposed development including earthworks contractors for the basement,
- ◊ Existing users of the site (adults and children),
- ◊ Future occupants and visitors of the new development (adults and children), and
- ◊ Workers (adults) engaged to maintain any buried services/utilities.

5.4 Potential Exposure Pathways

At this preliminary stage, potential exposure pathways include:

- ◊ Ingestion of soil (workers) during redevelopment of the site.
- ◊ Ingestion of soil (adults and children) during future use of the site.
- ◊ Direct (dermal) contact for future users of the site (via any unsealed / deep soil areas).
- ◊ Direct (dermal) contact for workers (adults) engaged to construct the proposed development or maintain any buried services/utilities.
- ◊ Inhalation of any volatile contaminants (if present).
- ◊ Inhalation of asbestos fibres from degraded ACM (if present).

6 SAMPLING AND ANALYSIS PROGRAM

The sampling and analysis program was designed with reference to the results of the PSI and the CSM. The purpose of the program was to characterise the soil conditions across the site in accordance with relevant EPA NSW guidelines to determine whether it would be suitable for the proposed land-use.

In accordance with NSW EPA *Contaminated Sites: Guidelines for NSW Site Auditor Scheme* (reference 7) and Appendix B of Schedule B2 of the NEPM (reference 4), the Data Quality Objectives (DQOs) process was used to define the type, quantity and quality of the data needed to support decisions relating to the environmental condition of a site. Details of the DQO process adopted for the soil sampling and analysis program is provided in **Appendix C**.

6.1 SAMPLING PROGRAM

The sampling program was undertaken on the 3rd June 2025 by Stephen McCormack and Sean Gao from GEE and the field work comprised:

- ◊ Drilling and logging of nineteen boreholes (BH201 to BH219) across the site, supplementing those installed during the previous PSI.
- ◊ Collection of representative soil samples from each borehole for targeted laboratory analysis of Chemicals of Potential Concern (CoPC).

6.1.1 Borehole Drilling and Logging

Boreholes BH212 to BH218 were drilled using a mechanical rig owned and operated by the FICO Group. The rig employed solid flight augers (SFA) equipped with a tungsten carbide bit. The remaining boreholes were inaccessible to the rig and were therefore drilled manually using a hand auger operated by GEE.

With the exception of BH204 and BH205, all boreholes penetrated through the surface fill (comprising imported or disturbed material) and terminated within either the underlying natural soil profile or weathered sandstone bedrock. Boreholes BH204 and BH205, located within the former bowling greens, encountered a collapsing gravel drainage layer, which prevented advancement into natural soil or bedrock.

Including the two boreholes (BH101 and BH102) from the PSI, the total number of sampling locations satisfies the minimum site characterisation density recommended in national guidance (Reference 10).

To minimise cross-contamination:

- The first length of the solid flight auger and the hand auger head were cleaned with Decon 90 (a laboratory-grade decontaminant) at the start of fieldwork and between borehole locations.
- Equipment was subsequently rinsed with clean water.
- A rinsate quality control sample (Sample ID: SM030625-R) was collected from the hand auger and analysed for volatile CoPC to verify the decontamination procedure.

During drilling, all encountered fill and natural soils were geologically logged, with careful documentation of any adverse aesthetics (e.g., odour, staining, colour changes). While no obvious Asbestos Containing Materials (ACM) were observed, some anthropogenic inclusions such as brick fragments were present in the fill layers.

Except for BH204 and BH205, all boreholes were dry at completion. In BH204 and BH205, perched seepage water was encountered within the basalt (blue metal) gravel drainage layer corresponding to the base of the bowling greens.

A summary of borehole details, including total depth, depth of fill, and depth to bedrock, is provided in **Table 2**, along with data from the PSI and JK Geotechnics boreholes. Borehole locations are presented in **Figures 2 and 3**.

Table 2: Summary of the Borehole Information

Borehole ID	Date Completed	Drilling Method	Total Depth	Depth of Filling [1]	Depth to Bedrock [1]	Well Screen Interval
			(m BGS)	(m BGS)	(m BGS)	(m BGS)
GEE DSI Boreholes 2025						
BH201	3 June 2025	HA	0.25	0.25	0.25	-
BH202	3 June 2025	HA	0.90	0.70	0.90	-
BH203	3 June 2025	HA	0.14	0.14	0.14	-
BH204	3 June 2025	HA	2.20	≥2.20	-	-
BH205	3 June 2025	HA	1.40	≥1.40	-	-
BH206	3 June 2025	HA	0.70	0.55	0.70	-
BH207	3 June 2025	HA	1.30	1.30	1.30	-
BH208	3 June 2025	HA	0.90	0.70	0.90	-
BH209	3 June 2025	HA	0.75	0.55	0.75	-
BH210	3 June 2025	HA	0.40	0.40	0.40	-
BH211	3 June 2025	HA	1.00	0.40	-	-
BH212	3 June 2025	SFA	2.60	0.40	2.60	-
BH213	3 June 2025	SFA	0.50	0.50	0.50	-
BH214	3 June 2025	SFA	0.90	0.55	0.90	-
BH215	3 June 2025	SFA	1.50	0.70	1.50	-
BH216	3 June 2025	SFA	1.00	0.50	1.00	-
BH217	3 June 2025	SFA	1.10	0.55	1.10	-
BH218	3 June 2025	SFA	0.90	0.50	0.90	-
BH219	3 June 2025	HA	0.80	0.60	-	-
GEE PSI Boreholes 2023						
BH101	25 July 2024	SFA / NMLC	10.23	0.10	1.72	5.0 – 9.0
BH102	25 July 2024	SFA / NMLC	5.70	0.30	1.50	2.6 – 5.6
JK Geotechnics Boreholes 2018						
BH1	16 Nov 2018	SFA / NMLC	9.00	0.70	1.60	3.0 – 9.0
BH2	12 Nov 2018	SFA / NMLC	8.92	1.65	3.10	-
BH3	12 Nov 2018	SFA / NMLC	8.98	0.80	2.00	-

m BGS = metres below ground surface
HA = Hand Auger
SFA = Solid Flight Auger
NMLC = Diamond Coring
Note 1: Depth of fill included the surface pavements.

6.1.2 Subsurface Conditions

The subsurface conditions, as observed in the boreholes, typically comprised a layer of fill material over natural sand and clayey sand soil which then graded into sandstone bedrock. Detailed descriptions of the subsurface conditions on site are provided in the GEE borehole logs provided in **Appendix D** and the JK borehole logs provided in **Appendix B**, while a summary of the subsurface conditions across the site are provided in **Table 3**.

Table 3: Summary of Subsurface Conditions and Geological Model

Layer / Unit	Description	Depth to Base of Layer (m)[1]	Soil Consistency / Relative Density[1] / Rock Strength
1 - FILL	ASPHALT / CONCRETE PAVEMENTS	0.1 to ≥2.20	--
	Silty SAND / Clayey SAND / Gravelly SAND / Sandy GRAVEL: orange, red, brown, grey, fine to coarse sand and gravel with trace anthropogenic inclusions (brick) in BH3, BH214, moist.		Variable
2 - NATURAL SOIL	SAND / Silty SAND with Clay and Clayey SAND: red, orange, brown, grey fine to medium grained, bands of highly weathered sandstone, moist.	1.5 – 3.1	Medium Dense to Dense
3 - BEDROCK	SANDSTONE: red, orange, grey and dark grey, fine to coarse grained, highly to moderately weathered.	4.8 – 5.5	Very Low to Low Strength
	SANDSTONE: orange, grey, red, fine to coarse, moderately to slightly weathered and fresh.	>10.23	Medium to High Strength

6.1.3 Soil Sampling

In accordance with NEPM (1999) Schedule B(2) Guideline on Site Characterisation (reference 4) soil samples were collected from each borehole at the near surface (0–300 mm) and then at approximately 0.5 m intervals, at transitions in fill or soil type, or where potential contamination was indicated (e.g. by odour, staining, unusual materials, or the presence of liquids).

Samples were collected manually using dedicated disposable nitrile gloves, following procedures consistent with Australian Standard AS4482.2 (Reference 12) and NEPM (2013) (Reference 4), to ensure sample integrity and representativeness. The soils were transferred into laboratory-supplied, acid-washed glass jars. For duplicate samples

intended for volatile analysis, the soils were not mixed but rather split in the field and placed directly into separate containers.

While field screening using instruments such as a PID was not undertaken, no hydrocarbon odours or other signs of volatile contaminants were noted during sampling. Additionally, most near-surface soil samples were sent for analysis of volatile fractions of Total Petroleum Hydrocarbons (TPH), which provides a more definitive assessment than field screening. No volatile contamination had been indicated in the earlier geotechnical investigation.

All laboratory samples were assigned a unique sample identification number, which included the project number and date of collection. These identifiers were also recorded on the relevant borehole logs (Appendix D).

In accordance with AS4482.1 (Reference 11), the sampling plan incorporated a range of Quality Assurance (QA) and Quality Control (QC) procedures, including:

- ◊ Collection of Quality Control samples
- ◊ Use of GEE standardised field sampling forms
- ◊ Documentation of the calibration and use of any field instruments

QC samples included blind replicates, split duplicates (at a minimum frequency of 5%), as well as trip blanks, trip spikes, and a rinsate blank from the auger. Further details on QA/QC sampling and results are provided in **Section 7** and **Appendix E**.

A summary of the samples collected and analysed during this investigation, including sampling depths and results from the previous PSI, is provided in **Table 4**.

Table 4 - Summary of the Soil Sampling and Analysis Program

Location	Sample Depth	Sample ID	Material Type	Analytical Program							
				Metals	TRH/ BTEXN	PAHs	OCPs	OPPs	PCBs	Phenolics / VOCs	Asbestos
DSI Primary Samples											
BH201	0.15 – 0.25	SM030625-69	FILL - Sandy GRAVEL	✓	✓	✓	✓	✓	✓	✓	✓
BH202	0.15 – 0.30	SM030625-50	FILL - Gravelly SAND	✓	✓	✓	✓	-	✓	-	✓
BH202	0.8 – 0.90	SM030625-51	Nat. SAND	✓	-	-	-	-	-	-	-
BH204	0.05 – 0.15	SM030625-01	FILL – Silty SAND	✓	-	✓	✓	✓	-	-	✓
BH204	0.30 – 0.40	SM030625-02	FILL – Silty SAND	-	-	-	-	-	-	-	-
BH204	0.50 – 0.50	SM030625-03	FILL – SAND	✓	-	-	✓	✓	-	-	✓
BH204	0.90 – 1.00	SM030625-04	FILL – Clayey SAND	✓	-	-	-	-	-	-	-
BH204	2.00 – 2.20	SM030625-05	FILL - GRAVEL	✓	-	-	✓	✓	-	-	-
BH205	0.05 – 0.20	SM030625-06	FILL – Silty SAND	✓	✓	✓	✓	-	✓	-	✓
BH205	0.30 – 0.40	SM030625-07	FILL – Silty SAND	-	-	-	-	-	-	-	-
BH205	0.40 – 0.50	SM030625-08	FILL –SAND	✓	-	-	✓	✓	-	-	-
BH205	0.80 – 0.90	SM030625-09	FILL – Clayey SAND	✓	-	-	✓	✓	-	-	-
BH205	1.30 – 1.40	SM030625-10	FILL - GRAVEL	✓	-	-	-	-	-	-	-
BH206	0.05 – 0.20	SM030625-11	FILL – Silty SAND	✓	-	-	✓	✓	-	-	✓
BH206	0.40 – 0.50	SM030625-12	FILL –SAND	✓	-	-	✓	✓	-	-	-
BH206	0.55 – 0.65	SM030625-13	Nat. Clayey SAND	✓	✓	✓	-	-	-	-	-
BH207	0.05 – 0.20	SM030625-14	FILL – Silty SAND	✓	✓	✓	✓	-	✓	-	✓
BH207	0.40 – 0.50	SM030625-15	FILL – SAND	✓	-	-	✓	✓	-	-	-

BH207	0.55 – 0.65	SM030625-16	FILL – Clayey SAND	✓	-	-	✓	✓	-	-	-
BH207	1.20 – 1.30	SM030625-17	FILL – Clayey SAND	✓	✓	✓	-	-	-	-	-
BH208	0.05 – 0.20	SM030625-22	FILL – Silty SAND	✓	✓	✓	✓	-	✓	-	✓
BH208	0.30 – 0.40	SM030625-23	FILL – Clayey SAND	✓	-	-	✓	✓	-	-	-
BH208	0.70 – 0.80	SM030625-24	Nat. SAND	✓	-	-	-	-	-	-	-
BH209	0.05 – 0.20	SM030625-19	FILL – Silty SAND	✓	-	✓	✓	✓	-	-	✓
BH209	0.40 – 0.50	SM030625-20	FILL –SAND	✓	-	-	✓	✓	-	-	-
BH209	0.60 – 0.70	SM030625-21	Nat. Clayey SAND	✓	-	-	-	-	-	-	-
BH210	0.14 – 0.30	SM030625-18	FILL – Gravelly SAND	✓	✓	✓	✓	✓	✓	✓	✓
BH211	0.05 – 0.20	SM030625-28	FILL – Silty SAND	✓	-	-	✓	✓	-	-	✓
BH211	0.40 - 0.50	SM030625-29	Nat. Clayey SAND	✓	-	-	-	-	-	-	-
BH211	0.80 – 1.00	SM030625-30	Nat. Clayey SAND	-	-	-	-	-	-	-	-
BH212	0.10 – 0.30	SM030625-66	FILL - Sandy GRAVEL	✓	✓	✓	-	-	-	-	✓
BH212	0.50 – 0.70	SM030625-67	Nat. Clayey SAND	✓	✓	✓	-	-	-	-	-
BH212	1.50 – 1.70	SM030625-68	Nat. Clayey SAND	-	-	-	-	-	-	-	-
BH213	0.10 – 0.30	SM030625-59	FILL – Gravelly SAND	✓	✓	✓	✓	-	✓	-	✓
BH214	0.10 – 0.30	SM030625-57	FILL – Sandy GRAVEL	✓	✓	✓	✓	-	✓	-	✓
BH214	0.60 – 0.70	SM030625-58	Nat. SAND	✓	-	✓	-	-	-	-	-
BH215	0.10 – 0.30	SM030625-52	FILL – Silty SAND	✓	✓	✓	-	-	-	-	✓
BH215	0.70 – 0.90	SM030625-53	Nat. Clayey SAND	✓	-	✓	-	-	-	-	-
BH215	1.30 – 1.50	SM030625-54	Nat. Clayey SAND	-	-	-	-	-	-	-	-
BH216	0.10 – 0.30	SM030625-55	FILL – Gravelly SAND	✓	✓	✓	✓	-	✓	-	✓

BH216	0.60 – 0.80	SM030625-56	Nat. SAND	✓	-	✓	-	-	-	-	-
BH217	0.10 – 0.30	SM030625-62	Nat. Silty SAND	✓	✓	✓	-	-	-	-	✓
BH217	0.60 – 0.80	SM030625-63	Nat. SAND	✓	✓	✓	-	-	-	-	-
BH217	0.90 – 1.00	SM030625-64	Nat. SAND	-	-	-	-	-	-	-	-
BH218	0.10 – 0.30	SM030625-60	FILL – Gravelly SAND	✓	✓	✓	✓	-	✓	-	✓
BH218	0.50 – 0.60	SM030625-61	Nat. Clayey SAND	✓	✓	✓	-	-	-	-	-
BH219	0.05 – 0.20	SM030625-25	FILL – Silty SAND	✓	-	-	✓	✓	-	-	✓
BH219	0.40 – 0.50	SM030625-26	FILL – SAND	✓	-	-	-	-	-	-	-
BH219	0.70 – 0.80	SM030625-27	Nat. Clayey SAND	-	-	-	-	-	-	-	-
		Total		42	18	23	24	16	10	2	19
DSI Quality Control Samples											
BH202	0.15 – 0.30	SM030625-100	Blind Replicate of SM030625-50	✓	✓	✓	✓	-	✓	-	-
BH212	0.50 – 0.70	SM030625-102	Blind Replicate of SM030625-67	✓	✓	✓	-	-	-	-	-
BH206	0.40 – 0.50	SM030625-104	Blind Replicate of SM030625-12	✓	-	-	✓	✓	-	-	-
BH218	0.50 – 0.60	SM030625-101	Split Duplicate of SM030625-61	✓	✓	✓	-	-	-	-	-
BH205	0.40 – 0.50	SM030625-103	Split Duplicate of SM030625-08	✓	-	-	✓	✓	-	-	-
BH201	0.15 – 0.25	SM030625-105	Split Duplicate of SM030625-69	✓	✓	✓	✓	-	✓	-	-
-	-	Trip Blank	Trip Blank	-	✓[1]	-	-	-	-	-	-
-	-	Trip Spike	Trip Spike	-	✓[2]	-	-	-	-	-	-
-	-	SM030625-R	Rinsate	✓	✓[1]	-	-	-	-	-	-

PSI Primary Samples											
BH101	0.2 – 0.3	ZZ250724-01	Nat. SAND	✓	✓	✓	✓	-	✓	-	✓
BH102	0.1 – 0.2	ZZ250724-02	Fill – Gravelly SAND	✓	✓	✓	✓	-	✓	-	✓
BH102	0.4 – 0.5	ZZ250724-03	Nat. SAND	✓	✓	✓	-	-	-	-	-
BH102	1.0 – 1.1	ZZ250724-04	Nat. SAND	-	-	-	-	-	-	-	-
		TOTALS		3	3	3	2	-	2	-	2

Note 1: Volatile TRH and BTEXN only.
Note 2: BTEXN Only

6.2 ANALYTICAL PROGRAM

The primary soil samples were analysed by Envirolab Services (Chatswood), a NATA-accredited laboratory certified for all analyses performed. A set of secondary (inter-laboratory) duplicate samples were analysed by Envirolab's Melbourne laboratory, which is also NATA-accredited for the relevant tests.

In accordance with Section 5.1, selected soil samples were analysed for the Contaminants of Potential Concern (CoPC) relevant to the borehole locations. These included:

- Metals: Arsenic, Cadmium, Chromium, Copper, Mercury, Nickel, Lead, Zinc
- Total Recoverable Hydrocarbons (TRH)
- Benzene, Toluene, Ethylbenzene, Xylenes, and Naphthalene (BTEXN)
- Polycyclic Aromatic Hydrocarbons (PAHs)
- Organochlorine Pesticides (OCPs)
- Organophosphorus Pesticides (OPPs)
- Polychlorinated Biphenyls (PCBs)
- Volatile Organic Compounds (VOCs)
- Phenolic Compounds
- Asbestos

A summary of the analytical program, including the specific samples selected and the suite of analytes tested, is provided in **Table 4**.

7 DATA QUALITY ASSESSMENT

A detailed Quality Assurance (QA) assessment, including the analysis of Quality Control (QC) samples, was carried out by GEE to determine the suitability and reliability of field procedures and analytical results. In accordance with Appendix C of Schedule B2 of the NEPM (reference 4), the QA assessment used Data Quality Indicators (DQIs) which included:

- precision.
- accuracy (or bias).
- representativeness.
- completeness.
- comparability.

The detailed QA assessment report is provided in **Appendix E** and concludes that the field procedures and analytical data presented herein are of suitable quality for making conclusions and recommendations regarding the contamination status of the site.

8 ASSESSMENT CRITERIA

To determine the significance of any contaminants detected in the soil and groundwater samples, appropriate Site Assessment Criteria (SAC) and Groundwater Acceptance Criteria (GAC) have been defined and are based on guidelines endorsed by the NSW EPA.

8.1 SOIL SAMPLES

For any contamination assessment, it is necessary to assess the human health and ecological risks associated with the presence of site contamination. Also, in accordance with the NSW EPA Site Auditor Guidelines (reference 4) and section 3.6 of Schedule B1 of the NEPM (reference 14), residential sites need to address aesthetics such as highly malodorous soils.

8.1.1 Aesthetics

Aesthetics were assessed in the field during borehole drilling and no significant observations were noted.

8.1.2 Ecological Risk

The site will be completely covered by buildings or pavements meaning that ecological interaction with soil contaminants will be limited. Therefore, ecological criteria are not relevant.

8.1.3 Health Risk

To address potential health impacts at the site, GEE has compared the analytical results against Health Investigation Levels (HILs) and Health Screening Levels (HSLs), provided in NEPM (2013), *Schedule B(1) – Guidelines on Investigation Levels for Soil and Groundwater* (reference 14).

8.1.3.1 Health Investigation Levels (HILs)

HILs for soil contaminants are provided in Table 1A(1) of the NEPM guidelines and have been developed for a broad range of metals and organic substances (i.e. PAHs, Pesticides and PCBs). Asbestos and petroleum hydrocarbons are not included.

The HILs are scientifically based, generic assessment criteria to be used as a first stage (or tier 1) screening of potential risks to human health from chronic exposure to contaminants. They are intentionally conservative and are based on the following four different and generic land use scenarios (or exposure scenarios) which are based on long-term exposures for the most sensitive receptor populations exposed:

- ◊ HIL-A described as residential with accessible soils and includes childcare centres, preschools and primary schools,
- ◊ HIL-B which includes residential with minimal opportunities for soil access and includes high rise apartments,
- ◊ HIL-C for public space such as parks and secondary schools, and
- ◊ HIL-D for commercial/industrial sites.

Each land-use scenario assumes different exposure scenarios and when land is used for more than one purpose, the HILs that are relevant to the more sensitive land-use should be adopted. In this regard the most relevant land use scenario would be HIL-B. A summary of the HIL-B criteria is provided in **Table 5**. Finally, it is important to note that an exceedance of the HIL does not necessarily mean that there is a risk, rather further appropriate evaluation and/or investigation is required.

8.1.3.2 Health Screening Levels (HSLs)

Health Screening Levels (HSLs) were developed for selected petroleum hydrocarbons (specifically TRH C_6 – C_{10} or F1 fraction, TRH >C_{10} – C_{16} or F2 fraction and BTEX) by the Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC CARE) and have been adopted and are referenced in Schedule B(1) of NEPM (2013 – reference 14) and Friebel & Nadebaum (2011 – reference 15). HSLs were also developed for asbestos in soil by the WA DoH (reference 16) and have been adopted in Schedule B(1) of NEPM.

Petroleum Hydrocarbons

The assessment of petroleum hydrocarbon contamination is primarily driven by human health concerns relating to:

1. Volatile components (e.g., TRH C_6 – C_{10}, TRH >C_{10} – C_{16} and Benzene) which have the potential to cause health issues via vapour intrusion (e.g., from inhalation), and
2. Direct contact with the hydrocarbons.

For vapour intrusion, different HSLs apply for different land use scenarios, different soil types (i.e. sand, silt and clay) and different depths. For the purpose of this investigation, criteria relevant for shallow (0m to 1m) soils has been adopted because they are the most conservative and most of the samples collected for analysis were from less than 1m depth. For soil type, the criteria for sand soils have been adopted because this was the dominant soil type.

With respect to land-use, there are five scenarios:

◊ HSL-A for low density residential sites

◊ HSL-B for high density residential sites

◊ HSL-C for recreational/open space areas

◊ HSL-D for commercial and industrial sites

◊ HSL – Intrusive Maintenance Workers

The first four land-use scenarios are based on the land-use at the lowest level (i.e. either ground or basement) because if vapour exposure is acceptable at this level, it can be assumed that it is also acceptable for the floors above ground level. In this regard, HSL-D is applicable for vapour intrusion for this part of the site. However, the HSL-A/B criteria has been adopted as a preliminary assessment of the analytical results. Intrusive maintenance worker HSLs are also relevant but are much higher than the soil vapour criteria.

For direct contact, which is also appropriate for the part of the site, different HSLs apply for various land-use scenarios. And the most appropriate for this site are those relating to HSL-B.

In summary, and for the purpose of a preliminary assessment of the results, GEE has adopted the lowest criteria from the HSLs for vapour intrusion (HSL-A/B), HSLs for the protection of intrusive maintenance workers and HSLs for direct contact (HSL-B). Like with the HILs, an exceedance of the HSL does not necessarily mean that there is a risk, rather further appropriate evaluation and/or investigation is required. A summary of the HSLs adopted for the site is provided in **Table 5**.

Asbestos is Soil

GEE has adopted a zero-tolerance approach to asbestos on the surface and therefore any detection of asbestos fibres will result in the need for further assessment and/or management. For asbestos fibres in soil, the HSL screening levels are based on scenario-specific likely exposure levels associated with land-use. Considering the proposed land-use GEE has adopted criteria for residential land-use with minimal access to soil.

Table 5: Soil Site Assessment Criteria (SAC)

Analyte	Health Investigation/Screening Levels (HILs/HSLs) (mg/kg)	Reference
Total Metals		
Arsenic	500	(HIL-B) Table 1A – Reference 14
Cadmium	150	(HIL-B) Table 1A – Reference 14
Chromium (VI)	500	(HIL-B) Table 1A – Reference 14
Copper	30,000	(HIL-B) Table 1A – Reference 14
Lead	1,200	(HIL-B) Table 1A – Reference 14
Mercury (inorganic)	120	(HIL-B) Table 1A – Reference 14
Nickel	1,200	(HIL-B) Table 1A – Reference 14
Zinc	60,000	(HIL-B) Table 1A – Reference 14
Polycyclic Aromatic Hydrocarbons (PAHs)		
Benzo(a)pyrene	--	--
Benzo(a)pyrene TEQ	4	(HIL-B) Table 1A – Reference 14
TOTAL PAHs	400	(HIL-B) Table 1A – Reference 14
Organochlorine and Organophosphate Pesticides (OCP/OPPs)		
Heptachlor	10	(HIL-B) Table 1A – Reference 14
Aldrin + Dieldrin	10	(HIL-B) Table 1A – Reference 14
Endrin	20	(HIL-B) Table 1A – Reference 14
Chlordane	90	(HIL-B) Table 1A – Reference 14
Endosulfan	400	(HIL-B) Table 1A – Reference 14
HCB	15	(HIL-B) Table 1A – Reference 14
Methoxychlor	500	(HIL-B) Table 1A – Reference 14
DDE + DDD + DDT	600	(HIL-B) Table 1A – Reference 14
Chlorpyrifos	340	(HIL-B) Table 1A – Reference 14
BTEXN		
Benzene	0.5	(HSL-A/B Vapour) Table 1A(3) – Reference 14
Toluene	160	(HSL-A/B Vapour) Table 1A(3) – Reference 14
Ethylbenzene	55	(HSL-A/B Vapour) Table 1A(3) – Reference 14
Xylenes	40	(HSL-A/B Vapour) Table 1A(3) – Reference 14
Naphthalene	3	(HSL-A/B Vapour) Table 1A(3) – Reference 14
Total Recoverable Hydrocarbons (TRH)		
(F1) C6 – C10	45	(HSL-A/B Vapour) Table 1A(3) – Reference 14
(F2) >C10 - C16	110	(HSL-A/B Vapour) Table 1A(3) – Reference 14
(F3) >C16 – C34	5,800	(HSL-B direct contact) Table A4 – Reference 15
(F4) >C34 – C40	8,100	(HSL-B direct contact) Table A4 – Reference 15
PCBs		
Total PCBs	1	(HIL-B) Table 1A – Reference 14
Phenolics		
Phenols	130 [1]	(HIL-B) Table 1A – Reference 14

Volatile Organic Compounds (VOCs)		
Tetrachloroethene (PCE)	<LOR	-
Tetrachloroethene (TCE)	<LOR	-
1,1,1-trichloroethane (1,1,1-TCA)	<LOR	-
Cis-1,2-dichloroethene	<LOR	-
Vinyl chloride	<LOR	-
PCBs		
Total PCBs	1	(HIL-B) Table 1A – Reference 14
Asbestos		
Surface Soil	No Visible Asbestos	(HSL-B) Table 7 – Reference 14
Buried Bonded	0.04%	(HSL-B) Table 7 – Reference 14
Buried Friable	0.001%	(HSL-B) Table 7 – Reference 14

Note 1: This is the lowest available criteria for phenolics and relates specifically to Pentachlorophenol. Other phenol compounds have higher thresholds.

9 ANALYTICAL RESULTS

A copy of the laboratory report is provided in **Appendix F**, while a summary of the results is provided in **Table 6** and discussed in the following sections.

9.1 METALS

A total of 42 primary soil samples were analysed during this investigation for arsenic, cadmium, chromium, copper, lead, nickel, mercury, and zinc, supplementing three samples from the previous PSI.

In summary, there were no sample concentrations above the health-based SAC.

9.2 TRH AND BTEXN

Eighteen (18) primary soil samples were analysed for Total Recoverable Hydrocarbons (TRH) and BTEXN (Benzene, Toluene, Ethylbenzene, Xylenes, and Naphthalene), in addition to three samples from the PSI.

In summary, the sample concentrations were below the relevant health-based SAC.

9.3 PAHs

Twenty-three (23) soil samples were analysed for Polycyclic Aromatic Hydrocarbons (PAHs), including calculation of the Benzo(a)Pyrene Toxicity Equivalent Quotient (BaP TEQ). This analysis complements three samples from the PSI.

In summary, the sample concentrations were below the relevant health-based SAC.

9.4 OCPs

Twenty-four (24) soil samples were analysed for Organochlorine Pesticides (OCPs), supplementing two samples from the PSI.

In summary, the concentrations were less than the adopted health-based SAC.

9.5 OPPs

Sixteen (16) soil samples were analysed for Organophosphorus Pesticides (OPPs) and all the concentrations were less than the adopted health-based SAC and the laboratory Limit Of Reporting (LOR).

9.6 PCBs

Ten (10) soil samples were analysed for Polychlorinated Biphenyls (PCBs), in addition to two PSI samples.

In summary, the concentrations were less than the adopted health-based SAC.

9.7 VOCs

Two (2) primary soil samples were analysed for Volatile Organic Compounds (VOCs). These were selected from boreholes located in areas where chemical storage was considered likely.

There are no published NEPM health-based criteria for VOCs; however, for screening purposes, GEE adopted the laboratory LOR. All concentrations were below the laboratory LOR.

9.8 PHENOL

Two (2) soil samples were analysed for phenolic compounds, also from boreholes in suspected former chemical storage areas.

In summary, the concentrations were less than the adopted health-based SAC and the laboratory Limit Of Reporting (LOR).

9.9 ASBESTOS

A total of nineteen (19) primary soil samples were analysed for the presence of asbestos during this investigation, supplementing two samples from the earlier PSI.

Asbestos was detected in one sample (SM030625-52), collected from the fill layer at BH215, which is located within the northern carpark (refer to **Figures 2 and 3** and **Plate 14** above).

The asbestos identified included a combination of Chrysotile, Amosite and Crocidolite fibres within a matted material and estimated to be present at a concentration of 1.37 g/kg, or 0.137% w/w, in a 34.78 g soil sample. This value exceeds both:

- ◊ The method reporting limit of 0.1 g/kg, and
- ◊ The NEPM (2013) HSL-B criterion of 0.04% w/w for bonded asbestos in soil.

The testing laboratory later clarified via email that:

- ◊ The total weight of the matted material in the sample was 0.0597 g, and
- ◊ Approximately 80% of this was visually estimated to be asbestos fibres, equating to 0.0478 g.

This gives a final asbestos concentration of 0.0478g of asbestos within 0.0478kg of soil which equals 1.37g/kg. A magnified photo of the material is provided as Plate 16 below.



Plate 16 – Close-up photo of the matted material from the fill at BH215 that contained asbestos fibres.

Further discussion of the significance of this result is provided in Section 10.4.1.

TABLE 6 - Summary of the Soil Analytical Results (HIL-B & HSL-B)

Analyte	Units	Limit Of Reporting (LOR)	Sample ID	SM030625-69	SM030625-105	SM030625-50	SM030625-100	SM030625-51	SM030625-01	SM030625-03	SM030625-04	SM030625-05	SM030625-06	SM030625-08	SM030625-103	SM030625-09	SM030625-10	Site Acceptance Criteria
			Location	BH201	Split	BH202	Blind	BH202	BH204	BH204	BH204	BH204	BH205	BH205	Split	BH205	BH205	Health Based Criteria (HILs & HSLs)
			Depth	0.15 – 0.25	Duplicate of	0.15 – 0.30	Replicate of	0.8 – 0.90	0.05 – 0.15	0.50 – 0.50	0.90 – 1.00	2.00 – 2.20	0.05 – 0.20	0.40 – 0.50	Duplicate of	0.80 – 0.90	1.30 – 1.40	
			Type	FILL - Sandy GRAVEL	SM030625-69	FILL - Gravelly SAND	SM030625-50	Nat. SAND	FILL – Silty SAND	FILL – SAND	FILL – Clayey SAND	FILL - GRAVEL	FILL – Silty SAND	FILL –SAND	SM030625-08	FILL – Clayey SAND	FILL - GRAVEL	
Asbestos ID Soil																		
Asbestos ID	g/kg	0.1		<0.1	-	<0.1	-	-	<0.1	<0.1	-	-	<0.1	-	-	-	-	**0.04%**
Trace Analysis [2]	Yes/No	-		No	-	No	-	-	No	No	-	-	No	-	-	-	-	**0.001%**
Lab Comment [3]	-	-		Nil	-	Nil	-	-	Nil	Nil	-	-	Nil	-	-	-	-	**-**
Metals																		
Arsenic	mg/kg	4		<4	<4	21	30	<4	<4	<4	10	27	<4	<4	<4	<4	7	**500**
Cadmium	mg/kg	0.4		<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	**150**
Chromium[1]	mg/kg	1		13	32	11	11	30	8	1	21	37	8	<1	1.2	5	13	**500**
Copper	mg/kg	1		29	22	5	8	<1	7	<1	1	<1	8	<1	<1	1	<1	**30,000**
Lead	mg/kg	1		5	4.6	12	15	11	8	2	12	7	7	2	1.2	8	10	**1,200**
Mercury	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1	1	0.2	<0.1	0.1	0.9	<0.1	<0.1	<0.1	<0.1	**120**
Nickel	mg/kg	1		12	21	2	5	1	4	<1	<1	2	4	<1	<1	<1	<1	**1,200**
Zinc	mg/kg	1		21	24	35	76	<1	13	4	4	2	13	7	6.1	7	7	**60,000**
BTEXN																		
Benzene	mg/kg	0.2		<0.2	<0.2	<0.2	<0.2	-	-	-	-	-	<0.2	-	-	-	-	**1**
Toluene	mg/kg	0.5		<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	<0.5	-	-	-	-	**160**
Ethylbenzene	mg/kg	1		<1	<1	<1	<1	-	-	-	-	-	<1	-	-	-	-	**55**
Total Xylenes	mg/kg	1		<1	<1	<1	<1	-	-	-	-	-	<1	-	-	-	-	**40**
Naphthalene	mg/kg	1		<1	<1	<1	<1	-	-	-	-	-	<1	-	-	-	-	**3**
TRH																		
TRH C_6 - C_{10} (F1)	mg/kg	25		<25	<25	<25	<25	-	-	-	-	-	<25	-	-	-	-	**45**
TRH >C_{10} - C_{16} (F2)	mg/kg	50		<50	<50	<50	<50	-	-	-	-	-	<50	-	-	-	-	**110**
TRH >C_{16}-C_{34} (F3)	mg/kg	100		<100	<100	<100	<100	-	-	-	-	-	<100	-	-	-	-	**5,800**
TRH >C_{34}-C_{40} (F4)	mg/kg	100		<100	<100	<100	<100	-	-	-	-	-	<100	-	-	-	-	**8,100**
PAHs																		
Benzo(a)pyrene	mg/kg	0.05		<0.05	<0.05	<0.05	<0.05	-	<0.05	-	-	-	<0.05	-	-	-	-	**-**
Benzo(a)pyrene TEQ	mg/kg	0.5		<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	**4**
Total PAHs	mg/kg	0.05		<0.05	<0.05	<0.05	<0.05	-	<0.05	-	-	-	<0.05	-	-	-	-	**400**
OCPs																		
Heptachlor	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	**10**
Aldrin	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	
Dieldrin	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	-	0.3	0.6	-	<0.1	0.2	0.3	0.31	<0.1	-	**10**
Endrin	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	**20**
gamma-Chlordane	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	
alpha-chlordane	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	**90**
Endosulfan I	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	
Endosulfan II	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	**400**
HCB	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	**15**
Methoxychlor	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	**500**
DDE + DDD + DDT	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	**600**
Remaining OCPs	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	-
OPPs																		
Chlorpyriphos	mg/kg	0.1		-	-	-	-	-	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	<0.1	-	**340**
Remaining OCPs	mg/kg	0.1		-	-	-	-	-	<0.1	<0.1	-	<0.1	-	<0.1	<0.1	<0.1	-	**-**
VOCs																		
Individual VOCs	mg/kg	0.1		<1	-	-	-	-	-	-	-	-	-	-	-	-	-	**<LOR**
Phenolics																		
Total Phenolics	mg/kg	0.1		<5	-	-	-	-	-	-	-	-	-	-	-	-	-	**130**
PCBs																		
Total PCBs	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	<0.1	-	-	-	-	**1**

TABLE NOTES:

Analytical results which exceed any of the Health-based Investigation Levels (HILs) are shown as **bold** text.

1 – Total Chromium analytical result includes chromium (III) and (VI).

2 - Trace Analysis relates results from Polarised Light microscopy and Dispersion Staining Techniques (Fibres not Visioble to the naked eye)

3 – The lab will comment if they observed asbestos fibres even if the concentration was below the LOR of 0.1g/kg

TABLE 6 - Summary of the Soil Analytical Results (HIL-B & HSL-B)

Analyte	Units	Limit Of Reporting (LOR)	Sample ID	SM030625-11	SM030625-12	SM030625-104	SM030625-13	SM030625-14	SM030625-15	SM030625-16	SM030625-17	SM030625-22	SM030625-23	SM030625-24	SM030625-19	SM030625-20	SM030625-21	Site Acceptance Criteria
			Location	BH206	BH206	Blind	BH206	BH207	BH207	BH207	BH207	BH208	BH208	BH208	BH209	BH209	BH209	Health Based Criteria (HILs & HSLs)
			Depth	0.05 – 0.20	0.40 – 0.50	Replicate of	0.55 – 0.65	0.05 – 0.20	0.40 – 0.50	0.55 – 0.65	1.20 – 1.30	0.05 – 0.20	0.30 – 0.40	0.70 – 0.80	0.05 – 0.20	0.40 – 0.50	0.60 – 0.70	
			Type	FILL – Silty SAND	FILL –SAND	SM030625-12	Nat. Clayey SAND	FILL – Silty SAND	FILL – SAND	FILL – Clayey SAND	FILL – Clayey SAND	FILL – Silty SAND	FILL – Clayey SAND	Nat. SAND	FILL – Silty SAND	FILL –SAND	Nat. Clayey SAND	
Asbestos ID Soil																		
Asbestos ID	g/kg	0.1		<0.1	-	-	-	<0.1	-	-	-	<0.1	-	-	<0.1	-	-	**0.04%**
Trace Analysis [2]	Yes/No	-		No	-	-	-	No	-	-	-	No	-	-	No	-	-	**0.001%**
Lab Comment [3]	-	-		Nil	-	-	-	Nil	-	-	-	Nil	-	-	Nil	-	-	**-**
Metals																		
Arsenic	mg/kg	4		<4	<4	<4	<4	<4	<4	6	<4	13	<4	<4	<4	<4	<4	**500**
Cadmium	mg/kg	0.4		<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	**150**
Chromium[1]	mg/kg	1		7	<1	1	10	6	1	9	6	9	12	10	8	1	12	**500**
Copper	mg/kg	1		8	<1	<1	<1	9	<1	1	<1	9	<1	<1	9	<1	<1	**30,000**
Lead	mg/kg	1		6	<1	<1	9	5	1	16	3	16	4	3	7	1	5	**1,200**
Mercury	mg/kg	0.1		0.5	<0.1	<0.1	<0.1	0.1	0.2	<0.1	<0.1	0.5	<0.1	<0.1	0.9	0.2	<0.1	**120**
Nickel	mg/kg	1		4	<1	<1	<1	3	<1	<1	2	5	<1	4	5	<1	<1	**1,200**
Zinc	mg/kg	1		14	6	6	1	13	6	10	3	33	<1	1	20	6	<1	**60,000**
BTEXN																		
Benzene	mg/kg	0.2		-	-	-	<0.2	<0.2	-	-	<0.2	<0.2	-	-	-	-	-	**1**
Toluene	mg/kg	0.5		-	-	-	<0.5	<0.5	-	-	<0.5	<0.5	-	-	-	-	-	**160**
Ethylbenzene	mg/kg	1		-	-	-	<1	<1	-	-	<1	<1	-	-	-	-	-	**55**
Total Xylenes	mg/kg	1		-	-	-	<1	<1	-	-	<1	<1	-	-	-	-	-	**40**
Naphthalene	mg/kg	1		-	-	-	<1	<1	-	-	<1	<1	-	-	-	-	-	**3**
TRH																		
TRH C_6 - C_{10} (F1)	mg/kg	25		-	-	-	<25	<25	-	-	<25	<25	-	-	-	-	-	**45**
TRH >C_{10} - C_{16} (F2)	mg/kg	50		-	-	-	<50	<50	-	-	<50	<50	-	-	-	-	-	**110**
TRH >C_{16}-C_{34} (F3)	mg/kg	100		-	-	-	<100	120	-	-	<100	<100	-	-	-	-	-	**5,800**
TRH >C_{34}-C_{40} (F4)	mg/kg	100		-	-	-	<100	240	-	-	<100	<100	-	-	-	-	-	**8,100**
PAHs																		
Benzo(a)pyrene	mg/kg	0.05		-	-	-	<0.05	<0.05	-	-	<0.05	<0.05	-	-	<0.05	-	-	**-**
Benzo(a)pyrene TEQ	mg/kg	0.5		-	-	-	<0.5	<0.5	-	-	<0.5	<0.5	-	-	<0.5	-	-	**4**
Total PAHs	mg/kg	0.05		-	-	-	<0.05	<0.05	-	-	<0.05	<0.05	-	-	<0.05	-	-	**400**
OCPs																		
Heptachlor	mg/kg	0.1		<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	**10**
Aldrin	mg/kg	0.1		<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	
Dieldrin	mg/kg	0.1		<0.1	0.2	0.3	-	<0.1	0.5	<0.1	-	<0.1	<0.1	-	0.2	0.6	-	**10**
Endrin	mg/kg	0.1		<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	**20**
gamma-Chlordane	mg/kg	0.1		<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	
alpha-chlordane	mg/kg	0.1		<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	**90**
Endosulfan I	mg/kg	0.1		<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	
Endosulfan II	mg/kg	0.1		<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	**400**
HCB	mg/kg	0.1		<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	**15**
Methoxychlor	mg/kg	0.1		<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	**500**
DDE + DDD + DDT	mg/kg	0.1		<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	**600**
Remaining OCPs	mg/kg	0.1		<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	-
OPPs																		
Chlorpyriphos	mg/kg	0.1		<0.1	<0.1	<0.1	-	-	<0.1	<0.1	-	-	<0.1	-	<0.1	<0.1	-	**340**
Remaining OCPs	mg/kg	0.1		<0.1	<0.1	<0.1	-	-	<0.1	<0.1	-	-	<0.1	-	<0.1	<0.1	-	**-**
VOCs																		
Individual VOCs	mg/kg	0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	**<LOR**
Phenolics																		
Total Phenolics	mg/kg	0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	**130**
PCBs																		
Total PCBs	mg/kg	0.1		-	-	-	-	<0.1	-	-	-	<0.1	-	-	-	-	-	**1**

TABLE NOTES:

Analytical results which exceed any of the Health-based Investigation Levels (HILs) are shown as **bold** text.

1 – Total Chromium analytical result includes chromium (III) and (VI).

2 - Trace Analysis relates results from Polarised Light microscopy and Dispersion Staining Techniques (Fibres not Visioble to the naked eye)

3 – The lab will comment if they observed asbestos fibres even if the concentration was below the LOR of 0.1g/kg

TABLE 6 - Summary of the Soil Analytical Results (HIL-B & HSL-B)

Analyte	Units	Limit Of Reporting (LOR)	Sample ID	SM030625-18	SM030625-28	SM030625-29	SM030625-66	SM030625-67	SM030625-102	SM030625-68	SM030625-59	SM030625-57	SM030625-58	SM030625-52	SM030625-53	SM030625-55	SM030625-56	Site Acceptance Criteria
			Location	BH210	BH211	BH211	BH212	BH212	Blind	BH212	BH213	BH214	BH214	BH215	BH215	BH216	BH216	Health Based Criteria (HILs & HSLs)
			Depth	0.14 – 0.30	0.05 – 0.20	0.40 - 0.50	0.10 – 0.30	0.50 – 0.70	Replicate of	1.50 – 1.70	0.10 – 0.30	0.10 – 0.30	0.60 – 0.70	0.10 – 0.30	0.70 – 0.90	0.10 – 0.30	0.60 – 0.80	
			Type	FILL – Gravelly SAND	FILL – Silty SAND	Nat. Clayey SAND	FILL - Sandy GRAVEL	Nat. Clayey SAND	SM030625-67	Nat. Clayey SAND	FILL – Gravelly SAND	FILL – Sandy GRAVEL	Nat. SAND	FILL – Silty SAND	Nat. Clayey SAND	FILL – Gravelly SAND	Nat. SAND	
Asbestos ID Soil																		
Asbestos ID	g/kg	0.1		<0.1	<0.1	-	<0.1	-	-	-	<0.1	<0.1	-	**>0.1**	-	<0.1	-	**0.04%**
Trace Analysis [2]	Yes/No	-		No	No	-	No	-	-	-	No	No	-	No	-	No	-	**0.001%**
Lab Comment [3]	-	-		Nil	Nil	-	Nil	-	-	-	Nil	Nil	-	**YES**	-	Nil	-	**-**
Metals																		
Arsenic	mg/kg	4		5	<4	<4	<4	5	<4	-	13	5	<4	<4	13	<4	<4	**500**
Cadmium	mg/kg	0.4		<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	-	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	**150**
Chromium[1]	mg/kg	1		16	6	11	78	26	10	-	39	20	6	5	31	24	15	**500**
Copper	mg/kg	1		35	8	<1	27	<1	<1	-	5	47	2	2	<1	53	2	**30,000**
Lead	mg/kg	1		7	13	10	6	24	17	-	11	7	10	8	15	5	8	**1,200**
Mercury	mg/kg	0.1		0.2	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**120**
Nickel	mg/kg	1		20	4	1	76	<1	<1	-	7	59	1	1	<1	120	1	**1,200**
Zinc	mg/kg	1		20	31	<1	36	2	1	-	10	27	1	8	<1	39	2	**60,000**
BTEXN																		
Benzene	mg/kg	0.2		<0.2	-	-	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	-	<0.2	-	**1**
Toluene	mg/kg	0.5		<0.5	-	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	-	<0.5	-	**160**
Ethylbenzene	mg/kg	1		<1	-	-	<1	<1	<1	-	<1	<1	-	<1	-	<1	-	**55**
Total Xylenes	mg/kg	1		<1	-	-	<1	<1	<1	-	<1	<1	-	<1	-	<1	-	**40**
Naphthalene	mg/kg	1		<1	-	-	<1	<1	<1	-	<1	<1	-	<1	-	<1	-	**3**
TRH																		
TRH C_6 - C_{10} (F1)	mg/kg	25		<25	-	-	<25	<25	<25	-	<25	<25	-	<25	-	<25	-	**45**
TRH >C_{10} - C_{16} (F2)	mg/kg	50		<50	-	-	<50	<50	<50	-	<50	<50	-	<50	-	<50	-	**110**
TRH >C_{16}-C_{34} (F3)	mg/kg	100		<100	-	-	<100	<100	<100	-	110	<100	-	<100	-	<100	-	**5,800**
TRH >C_{34}-C_{40} (F4)	mg/kg	100		<100	-	-	<100	<100	<100	-	110	<100	-	<100	-	<100	-	**8,100**
PAHs																		
Benzo(a)pyrene	mg/kg	0.05		<0.05	-	-	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	**-**
Benzo(a)pyrene TEQ	mg/kg	0.5		<0.5	-	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**4**
Total PAHs	mg/kg	0.05		<0.05	-	-	0.4	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	**400**
OCPs																		
Heptachlor	mg/kg	0.1		<0.1	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	<0.1	-	**10**
Aldrin	mg/kg	0.1		<0.1	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	<0.1	-	
Dieldrin	mg/kg	0.1		<0.1	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	<0.1	-	**10**
Endrin	mg/kg	0.1		<0.1	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	<0.1	-	**20**
gamma-Chlordane	mg/kg	0.1		<0.1	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	<0.1	-	
alpha-chlordane	mg/kg	0.1		<0.1	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	<0.1	-	**90**
Endosulfan I	mg/kg	0.1		<0.1	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	<0.1	-	
Endosulfan II	mg/kg	0.1		<0.1	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	<0.1	-	**400**
HCB	mg/kg	0.1		<0.1	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	<0.1	-	**15**
Methoxychlor	mg/kg	0.1		<0.1	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	<0.1	-	**500**
DDE + DDD + DDT	mg/kg	0.1		<0.1	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	<0.1	-	**600**
Remaining OCPs	mg/kg	0.1		<0.1	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	-	<0.1	-	-
OPPs																		
Chlorpyriphos	mg/kg	0.1		-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	**340**
Remaining OCPs	mg/kg	0.1		-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	**-**
VOCs																		
Individual VOCs	mg/kg	0.1		<1	-	-	-	-	-	-	-	-	-	-	-	-	-	**<LOR**
Phenolics																		
Total Phenolics	mg/kg	0.1		<5	-	-	-	-	-	-	-	-	-	-	-	-	-	**130**
PCBs																		
Total PCBs	mg/kg	0.1		<0.1	-	-	-	-	-	-	<0.1	<0.1	-	-	-	<0.1	-	**1**

TABLE NOTES:

Analytical results which exceed any of the Health-based Investigation Levels (HILs) are shown as **bold** text.

1 – Total Chromium analytical result includes chromium (III) and (VI).

2 - Trace Analysis relates results from Polarised Light microscopy and Dispersion Staining Techniques (Fibres not Visioble to the naked eye)

3 – The lab will comment if they observed asbestos fibres even if the concentration was below the LOR of 0.1g/kg

TABLE 6 - Summary of the Soil Analytical Results (HIL-B & HSL-B)

Analyte	Units	Limit Of Reporting (LOR)	Sample ID	SM030625-62	SM030625-63	SM030625-60	SM030625-61	SM030625-101	SM030625-25	SM030625-26	BH101	BH102	BH102	BH102	Site Acceptance Criteria
			Location	BH217	BH217	BH218	BH218	Split	BH219	BH219	0.2 – 0.3	0.1 – 0.2	0.1 – 0.2	0.4 – 0.5	Health Based Criteria (HILs & HSLs)
			Depth	0.10 – 0.30	0.60 – 0.80	0.10 – 0.30	0.50 – 0.60	Duplicate of	0.05 – 0.20	0.40 – 0.50	ZZ250724-01	ZZ250724-02	ZZ250724-100	ZZ250724-03	
			Type	Nat. Silty SAND	Nat. SAND	FILL – Gravelly SAND	Nat. Clayey SAND	SM030625-61	FILL – Silty SAND	FILL – SAND	Nat. SAND	Fill – Gravelly SAND	Blind Replicate of ZZ250724-02	Nat. SAND	
Asbestos ID Soil															
Asbestos ID	g/kg	0.1		<0.1	-	<0.1	-	-	<0.1	-	<0.1	<0.1	-	-	**0.04%**
Trace Analysis [2]	Yes/No	-		No	-	No	-	-	No	-	No	No	-	-	**0.001%**
Lab Comment [3]	-	-		Nil	-	Nil	-	-	Nil	-	Nil	Nil	-	-	**-**
Metals															
Arsenic	mg/kg	4		<4	<4	6	<4	<4	<4	<4	14	12	8	6	**500**
Cadmium	mg/kg	0.4		<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	**150**
Chromium[1]	mg/kg	1		6	7	14	11	15	7	2	34	16	17	29	**500**
Copper	mg/kg	1		1	<1	11	2	1.5	7	<1	2	7	13	<1	**30,000**
Lead	mg/kg	1		5	12	13	15	16	6	1	13	24	19	9	**1,200**
Mercury	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1	<0.1	0.8	0.1	<0.1	<0.1	<0.1	<0.1	**120**
Nickel	mg/kg	1		<1	<1	3	<1	<1	4	<1	2	7	24	1	**1,200**
Zinc	mg/kg	1		1	<1	12	2	1.5	12	6	7	35	35	6	**60,000**
BTEXN															
Benzene	mg/kg	0.2		<0.2	<0.2	<0.2	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	<0.2	**1**
Toluene	mg/kg	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	**160**
Ethylbenzene	mg/kg	1		<1	<1	<1	<1	<1	-	-	<1	<1	<1	<1	**55**
Total Xylenes	mg/kg	1		<1	<1	<1	<1	<1	-	-	<1	<1	<1	<1	**40**
Naphthalene	mg/kg	1		<1	<1	<1	<1	<1	-	-	<1	<1	<1	<1	**3**
TRH															
TRH C_6 - C_{10} (F1)	mg/kg	25		<25	<25	<25	<25	<25	-	-	<25	<25	<25	<25	**45**
TRH >C_{10} - C_{16} (F2)	mg/kg	50		<50	<50	<50	<50	<50	-	-	<50	<50	<50	<50	**110**
TRH >C_{16}-C_{34} (F3)	mg/kg	100		<100	<100	<100	<100	<100	-	-	<100	<100	<100	<100	**5,800**
TRH >C_{34}-C_{40} (F4)	mg/kg	100		<100	<100	<100	<100	<100	-	-	<100	<100	<100	<100	**8,100**
PAHs															
Benzo(a)pyrene	mg/kg	0.05		<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	**-**
Benzo(a)pyrene TEQ	mg/kg	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	**4**
Total PAHs	mg/kg	0.05		<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	**400**
OCPs															
Heptachlor	mg/kg	0.1		-	-	<0.1	-	-	<0.1	-	<0.1	<0.1	<0.1	-	**10**
Aldrin	mg/kg	0.1		-	-	<0.1	-	-	<0.1	-	<0.1	<0.1	<0.1	-	**10**
Dieldrin	mg/kg	0.1		-	-	<0.1	-	-	0.2	-	<0.1	<0.1	<0.1	-	
Endrin	mg/kg	0.1		-	-	<0.1	-	-	<0.1	-	<0.1	<0.1	<0.1	-	**20**
gamma-Chlordane	mg/kg	0.1		-	-	<0.1	-	-	<0.1	-	<0.1	<0.1	<0.1	-	**90**
alpha-chlordane	mg/kg	0.1		-	-	<0.1	-	-	<0.1	-	<0.1	<0.1	<0.1	-	
Endosulfan I	mg/kg	0.1		-	-	<0.1	-	-	<0.1	-	<0.1	<0.1	<0.1	-	**400**
Endosulfan II	mg/kg	0.1		-	-	<0.1	-	-	<0.1	-	<0.1	<0.1	<0.1	-	
HCB	mg/kg	0.1		-	-	<0.1	-	-	<0.1	-	<0.1	<0.1	<0.1	-	**15**
Methoxychlor	mg/kg	0.1		-	-	<0.1	-	-	<0.1	-	<0.1	<0.1	<0.1	-	**500**
DDE + DDD + DDT	mg/kg	0.1		-	-	<0.1	-	-	<0.1	-	<0.1	<0.1	<0.1	-	**600**
Remaining OCPs	mg/kg	0.1		-	-	<0.1	-	-	<0.1	-	<0.1	<0.1	<0.1	-	-
OPPs															
Chlorpyriphos	mg/kg	0.1		-	-	-	-	-	<0.1	-	-	-	-	-	**340**
Remaining OCPs	mg/kg	0.1		-	-	-	-	-	<0.1	-	-	-	-	-	**-**
VOCs															
Individual VOCs	mg/kg	0.1		-	-	-	-	-	-	-	-	-	-	-	**<LOR**
Phenolics															
Total Phenolics	mg/kg	0.1		-	-	-	-	-	-	-	-	-	-	-	**130**
PCBs															
Total PCBs	mg/kg	0.1		-	-	<0.1	-	-	-	-	<0.1	<0.1	<0.1	-	**1**

TABLE NOTES:

Analytical results which exceed any of the Health-based Investigation Levels (HILs) are shown as **bold** text.

1 – Total Chromium analytical result includes chromium (III) and (VI).

2 - Trace Analysis relates results from Polarised Light microscopy and Dispersion Staining Techniques (Fibres not Visioble to the naked eye)

3 – The lab will comment if they observed asbestos fibres even if the concentration was below the LOR of 0.1g/kg

10 SITE CHARACTERISATION

A summary of the investigation results is presented below and includes a summary of the findings from the previous PSI (reference 1).

10.1 SITE HISTORY AND POTENTIAL FOR CONTAMINATION

The Site

The site was originally part of a larger parcel of land that was originally Crown Land, comprising bushland / scrubland.

Initial development of the site occurred between 1943 and 1951 when the northern allotment (Lot 31) was cleared of vegetation and a house was constructed at the eastern end of this allotment.

In 1957 the Forestville RSL Sub- branch acquired the southern allotment (Lot 2589) via a long-term lease before clearing the bushland and soon thereafter they constructed the first RSL Club building in the centre of this allotment. The two bowling greens at the southern end of the site were also constructed at this time along with the existing memorial garden in the front (east) of the Club building. The northern part of this allotment was converted into a carpark.

Between 1961 and 1965, a tennis court was constructed between the Club building and the western boundary.

Between 1965 and 1970, the main club building was either replaced or significantly renovated, with several more alterations and additions to the Club building occurring up until 2005, including the removal of the tennis court.

Between 1994 and 2005, the RSL Club acquired the northern allotment (Lot 31) and subsequently demolished the former house and expanded their carpark across this allotment.

From 2005, there were no significant changes to the site and its layout.

In summary, the historical site activities are considered to be relatively benign from a land contamination perspective. However, the age of the original house in the northern part of the site, and the original RSL Club building, suggests that Asbestos Containing Material (ACM) and lead based paints may have been used. Therefore, any renovations,

maintenance, or the demolition of these structures, may have resulted in near surface soils being impacted with lead and/or ACM.

Surrounding Land

The surrounding land within 150m of the site was tree covered bushland / scrubland, with some agricultural land further to the east, until 1951 when the early stages of development of Forestville began. Between 1951 and 1961 the surrounding area quickly transitioned into low density residential dwellings with recreational parkland and a school nearby, as returned soldiers started to populate the area and assisted with construction of the houses.

The historical business directories noted some former businesses within proximity of the site which are often related to site contamination and have the potential to cause chemical contamination beyond their boundaries via groundwater or vapour migration. This included a number of service stations and dry cleaners within 400m of the site. However, the location of these businesses and distances relative to the site suggest that any contamination from these properties are unlikely to have impacted the site.

10.2 Site Description and Surface Conditions

At the time of this investigation, and the earlier PSI, the site was occupied by a two-storey Forestville RSL Club building that was located centrally to the site and was bounded by an open-air, asphalt paved carpark to the north, two bowling greens to the south (making up the entire southern portion of the site), and a war memorial garden to the east (between the club building and Melwood Avenue). The lower level of the club building interior comprised the gaming room, dining areas, kitchen, bars in the main area (accessible to customers), various staff rooms and storage rooms (some utilised for minor storage of cleaning/industrial chemicals), the loading dock and the cooler room in the back area. On the upper level were mixed-use rooms, including a board room, function rooms, a snooker room and offices. Neither of the bowling greens were being utilised (or maintained) for lawn bowling, and half of the bowling green on the western side had been converted into an alfresco dining area.

Near the bowling greens, and attached to the rear south-western corner of the RSL Club building, was the green keepers shed. The shed was being utilised for storage of maintenance equipment, outdoor furniture/décor and minor storage of chemicals (including paint/lacquer and turpentine). Adjacent to the eastern border (between the main entrance driveway and the memorial garden) was a small shed containing pumps relating to fire response systems. This fire response pump shed was concurrently being

utilised for minor storage of fertiliser (dynamic lifter) and fuel in jerry cans (which presented a moderate hydrocarbon odour).

Based on the regional topography and the site inspection there is potential for fill material to have been introduced to site to raise the site surface or create a level platform for the existing buildings and the bowling greens in the southern portion of the site. This is supported by the fact that the former geotechnical boreholes by JK Geotechnics Pty Ltd (reference 3), adjacent to the bowling greens, did encounter some fill material ranging in depth from 0.7m to 1.65m (**Appendix B**).

Aside from the moderate hydrocarbon odour noted within the fire response pump shed, there were no other unusual odours or surface staining that could be potentially associated with contamination. There was no evidence of under-ground or above-ground, fuel or chemical, storage tanks observed across the site. Building demolition was observed within the garden bed adjacent to the back fence at the southern end of the site (which presents potential asbestos contamination), otherwise, there was no obvious evidence of Asbestos Containing Materials (ACM) on the surface of the site.

10.3 Potential For Contamination

Based on the site history information, combined with a review of the site's physical and environmental setting, the main areas of environmental concern (AEC) and sources of potential contamination are as follows:

Onsite Areas and Sources of Potential Contamination	
Entire Site. In Particular the south-eastern half.	Fill Material: There exists some fill material (i.e. either imported soil material or previously disturbed soil) beneath the site. If imported to site, and sourced from an unknown location, the quality of fill material is also unknown and potentially contaminated.
Vehicle Accessible Areas / Carparks (particularly the northern carpark)	Past and Present Vehicle Movements: Vehicles accessing and parking on site may have resulted in leaks and spillage of fuel and oils.
Entire Site	Use of Lead based Paint and Asbestos Containing Materials (ACM) on existing and former structures: Any renovations or maintenance work over the years, or the demolition of former structures, may have resulted in near surface soil being impacted with lead and asbestos.
Bowling Greens (Southern Portion of Site)	Application of Fertilisers and Herbicides for Bowling Green Maintenance: As part of the maintenance and upkeep of the bowling greens, fertiliser and/or herbicide application may have resulted in near surface soils and potentially underlying soils being impacted with pesticides and to a lesser extent metals.

Areas of Current and Past Storage of Chemicals. (i.e. Greenkeepers shed, Fire Response System Shed & Storage Room in the north-west corner of the RSL Club)	Minor Storage of Chemicals: This may have resulted in top-down contamination from leaking or spilt chemicals. However, the concrete floor slab in these areas is likely to have restricted any migration of the chemicals.
Off-Site Areas and Sources of Potential Contamination	
-	-

There were no off-site sources deemed likely to affect the site via groundwater or vapour intrusion.

Contamination, if present, is expected to originate from top-down sources, and therefore affect the near-surface fill or natural soils. While groundwater contamination is unlikely, it was assessed as part of the PSI (Refer to Section 10.5). Soil vapour was not specifically tested but should be evaluated if volatile contaminants are encountered in future soil or groundwater testing.

Potential receptors include:

◊ Construction and earthworks contractors

◊ Existing site users (staff, patrons, visitors)

◊ Future residents and visitors to the development

◊ Workers maintaining underground services/utilities

10.4 Soil Assessment

Soil conditions were investigated at 21 borehole locations (BH101 and BH102 from the PSI, and BH201–BH219 from this DSI), as shown in **Figure 2** and **Figure 3**. Boreholes were arranged systematically, targeting known or suspected AECs, while accommodating access and service constraints.

Subsurface conditions typically comprised fill (disturbed or imported) overlying natural sandy soil, grading into weathered sandstone bedrock. Fill depth ranged from 0.1 m to ≥2.2 m, deepest beneath the bowling greens. Depth to bedrock varied from 0.14 m (beneath the Club) to 3.1 m (south-east portion).

A total of 45 soil samples were submitted for NATA-accredited laboratory analysis for the full suite of CoPC:



- ◊ Metals (As, Cd, Cr, Cu, Ni, Pb, Hg, Zn).
- ◊ TRH, BTEXN, PAHs, VOCs.
- ◊ OCPs, OPPs, Phenolics, PCBs.
- ◊ Asbestos.

All chemical concentrations were below the relevant SACs while there was one sample of near-surface fill material at BH215 contained asbestos fibres bonded to a matted material (refer to **Figures 2 and 3** and **Plate 16** above). The asbestos identified included a combination of Chrysotile, Amosite and Crocidolite fibres within the matted material and estimated to be present at a concentration of 1.37 g/kg, or 0.137% w/w, in a 34.78 g soil sample. This value exceeds both

- ◊ The method reporting limit of 0.1 g/kg, and
- ◊ The NEPM (2013) HSL-B criterion of 0.04% w/w for bonded asbestos in soil.

The asbestos impacted fill was located beneath asphalt in the carpark area, posing no immediate risk to current users. However, the material may pose a risk to construction workers, and remediation and delineation of asbestos-impacted soil is recommended as part of the site redevelopment.

10.5 Groundwater Conditions

Groundwater conditions beneath the site were assessed as part of the previous PSI using water collected from three (3) monitoring wells installed across the site by GEE (BH101, BH102) and JK (BH1). The location of the wells is shown on **Figure 2** and **Figure 3**.

Stabilised groundwater levels and field parameters were recorded during sampling. Depth to groundwater ranged from 2.19 m to 3.23 m below ground surface, with inferred flow direction towards the south-east, aligning with the local topography and Bates Creek (~500 m away). Groundwater was slightly acidic and of low electrical conductivity, with low dissolved oxygen, typical of groundwater conditions.

To assess the presence of contamination within the groundwater beneath the site, water from the wells was tested for:

- ◊ Dissolved metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg).
- ◊ TRH, PAHs, VOCs (including BTEXN).
- ◊ Hardness.

Results were compared against Groundwater Acceptance Criteria (GACs) appropriate for the site's environmental setting.

11 CONCLUSION AND RECOMMENDATIONS

Geo-Environmental Engineering (GEE) was commissioned by Forestville RSL Club Limited to undertake a Detailed Site Investigation (DSI) for the property at 20–22 Melwood Avenue, Forestville NSW 2087 (herein referred to as 'the site'). The site encompasses approximately 8,970 m² (by calculation) and includes the following legal allotments:

◊ Lot 31 in Deposited Plan (DP) 366454 (No. 20 Melwood Avenue)

◊ Lot 2589 in DP 752038 (No. 22 Melwood Avenue)

This DSI supplements an earlier Preliminary Site Investigation (PSI) completed by GEE in 2024. Both investigations support the proposed redevelopment of the Forestville RSL Club, including the construction of a senior's living development. The site is currently occupied by the RSL Club building and memorial garden (central portion), an asphalt carpark (north), and disused bowling greens (south).

The objectives of the PSI and DSI were to:

◊ Address the requirements of the State Environmental Planning Policy (Resilience and Hazards) 2021 (Reference 2),

◊ Assess the suitability of the site for the proposed residential land use,

◊ Identify any potential environmental constraints, and

◊ Support the Development Application to Northern Beaches Council.

The investigation comprised a:

◊ Review of the previous PSI report,

◊ A detailed site inspection for potential sources of contamination,

◊ Preparation of an initial Conceptual Site Model (CSM),

◊ Field investigations including:

  - The drilling and logging of nineteen boreholes (BH201 and BH219) across the site which complement the previous two boreholes (BH101 and BH102), and
  - Sampling of soil from the boreholes.

◊ Laboratory analysis of selected soil samples for Chemicals of Potential Concern (CoPC).

Based on:

◊ Field observations made during site works,

- ◊ The results of the sampling and laboratory analysis,
- ◊ The proposed land use, and
- ◊ Applicable statutory guidelines,

GEE concludes that the site is not currently suitable for the proposed development due to the detection of asbestos fibres bonded to matted material in one location (BH215) within the northern carpark. This material poses a potential health risk to construction workers, particularly during earthworks associated with the proposed Stage 2 redevelopment.

Despite this, the asbestos impacted soil, the site can be made suitable for the proposed development by undertaking convention management and/or remediation measures which GEE recommends that this is completed during proposed demolition works along with some delineation of the extent of the asbestos impacted soil. Finally, in accordance with State and local planning guidelines, a Remedial Action Plan (RAP) will be required to detail the proposed remediation methodology.

12 REFERENCES

1. Geo-Environmental Engineering Pty Ltd, 2025: Preliminary Site Contamination Investigation, Proposed RSL Club Redevelopment, 20-22 Melwood Avenue, Forestville NSW. Prepared for the Forestville RSL Club Limited. Report ID: E24016FOR-R02F Rev 1 Dated 13th May 2025.
2. NSW Government, 2021: State Environmental Planning Policy (Resilience and Hazards) 2021.
3. NSW EPA, 2020: Environment Protection Authority 2020: Contaminated Land Guidelines: Consultants Reporting on Contaminated Land. EPA NSW 5 May 2020.
4. NEPM, 2013: National Environment Protection (Assessment of Site Contamination) Measure 1999 - Schedule B(2) Guideline of Site Characterisation. As amended 16 May 2013.
5. Geo-Environmental Engineering Pty Ltd, 2025: Geotechnical Investigation Report, Proposed RSL Club Redevelopment, 20-22 Melwood Avenue, Forestville NSW. Prepared for the Forestville RSL Club Limited. Report ID: E24016FOR-R01F Rev 1 Dated 2nd May 2025.
6. JK Geotechnics, 2023: Specialist Advice to Forestville RSL Club on Geotechnical Investigation at 22 Melwood Avenue, Forestville, NSW. Report Reference: 31993BMrpt Dated 27 January 2023.
7. Department of Mineral Resources, 1983: Sydney 1:100,000 Geological Series Map Sheet 9130 (Edition 1).
8. Department of Land and Water Conservation (DLWC), 2004: Sydney 1:100 000 Soil Landscape Series Sheet 9130 (second edition).
9. Land and Water Biodiversity Committee (2012): Minimum Construction Requirements for Water Bores in Australia. Edition 3 Revised February 2012.
10. NSW EPA, 2022: Environment Protection Authority NSW, 2022: Contaminated Land Guidelines: Sampling Design – Part 1. August 2022.
11. Australian Standard AS4482.1 – 2005 Guide to the sampling and investigation of potentially contaminated soil Part 1: Non-volatile and semi-volatile compounds.
12. Australian Standard AS4482.2 (1999). *Australian Standard Guide to the Sampling and Investigation of Potentially Contaminated Soil - Part 2: Volatile substances*.
13. ANZECC/ARMCANZ, 2000: Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of



Australia and New Zealand, 2000: Guidelines for Fresh and Marine Water Quality, National Water Quality Management Strategy. October 2000.

14. NEPC, 2013: National Environment Protection Council (1999). National Environment Protection (Assessment of Site Contamination) Measure. Schedule B(1) Guideline on the Investigation Levels for Soil and Groundwater.

15. Friebel & Nadebaum (2011): Technical Report No. 10 - Health screening levels for petroleum hydrocarbons in soil and groundwater Part 1: Technical development document. CRC for Contamination Assessment and Remediation of the Environment.

16. Western Australian Department of Health, 2009: Guidelines for the Assessment, Remediation and Management of Asbestos – Contaminated Sites in Western Australia, May 2009.

17. NSW Department of Environment and Conservation (NSW DEC), 2007: Guideline for the Assessment and Management of Groundwater Contamination. March 2007.

18. Pells et al, 2019: Classification of Sandstones and Shale in the Sydney Region: A Forty Year Review. Australian Geomechanics Society, 2019.

FIGURES

1 – SITE LOCATION MAP
2 - SITE PLAN (SURVEY)
3 – SITE PLAN (AERIAL)

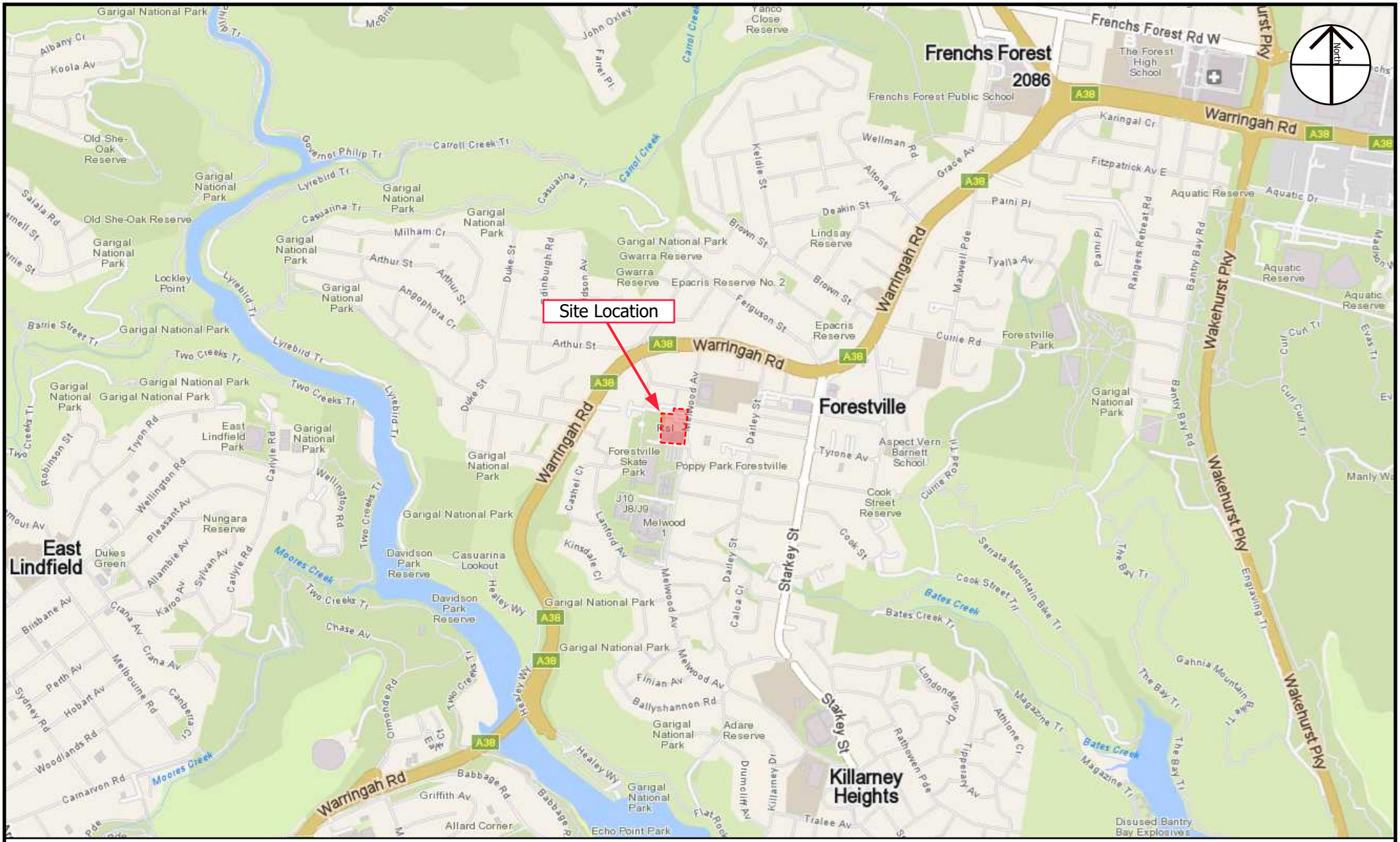
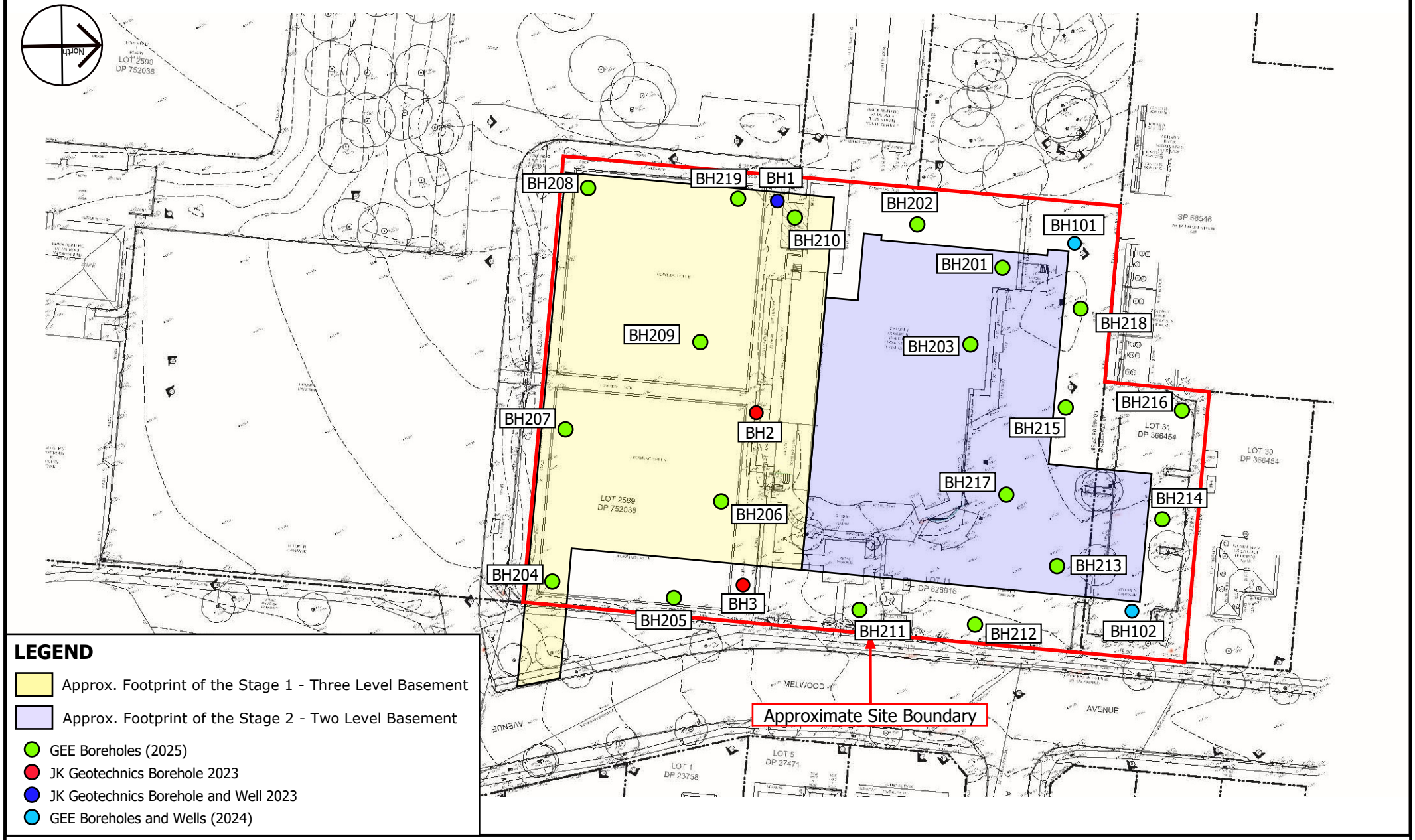


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geo-environmental ENGINEERING
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TITLE: SITE LOCATION MAP 20 - 22 Melwood Ave, Forestville NSW	SCALE: **N.T.S**	DATE: **2 June 2025**	FIGURE No.: **1**
	DRAWN: **S. McC**	JOB No.: **E24016FOR**	REVISION: **A**



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www.geoenvironmental.com.au

TITLE: **Site Plan (SURVEY)** 20-22 Melwood Ave, Forestville NSW	SCALE: **N.T.S**	DATE: **13 June 2025**	FIGURE No.: **2**
	DRAWN: **S. Gao**	JOB No.: **E24016FOR**	REVISION: A



Image Provide by Nearmap (http://maps.au.nearmap.com.au) - Image Date: 9 January 2023

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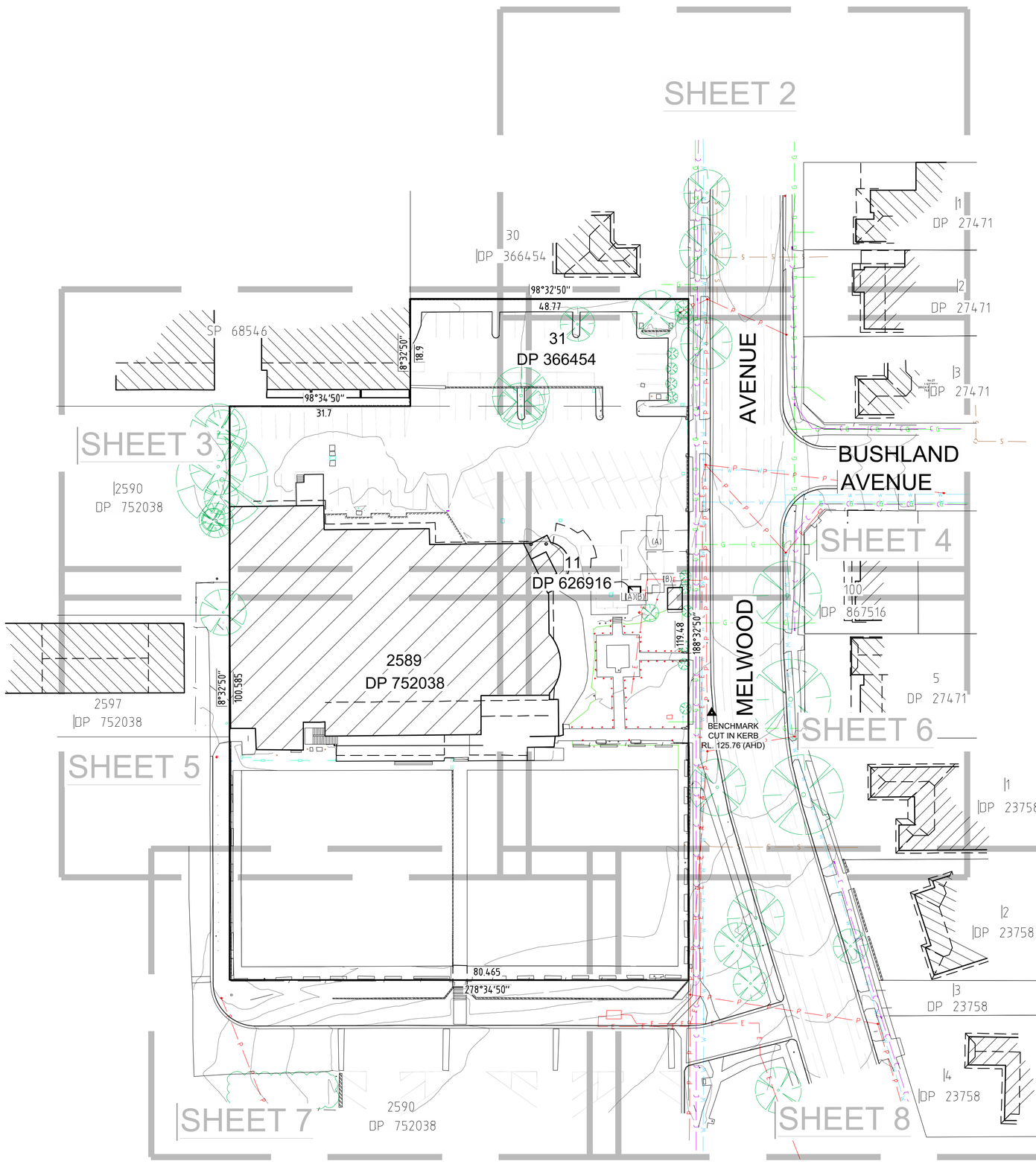
TITLE: **SITE PLAN (AERIAL)** 20-22 Melwood Ave, Forestville NSW	SCALE: **N.T.S**	DATE: **2 June 2025**	FIGURE No.: **3**
	DRAWN: **S. McC**	JOB No.: **E24016FOR**	REVISION: **A**

APPENDIX A

SURVEY AND ARCHITECTURAL PLANS

LEGEND

BENCH MARK	▲
TELSTRA PIT	TEL
ELECTRIC LIGHT POLE	ELP
ELECTRIC LIGHT BOLLARD	LB
ELECTRICITY PIT	EPIT
ELECTRICITY BOX	EL
POWER POLE	PP
POWER POLE WITH LIGHT	PPL
GRATED INLET PIT	GIP
DRAIN	DRN
SEWER MANHOLE	SMH
SEWER INSPECTION POINT	SIP
STOP VALVE	SV
HYDRANT	HYD
WATER METER	WM
WATER TAP	TAP
PIT WITH CONCRETE LID	CLID
PIT WITH METAL LID	MLID
STREET SIGN	SS
BOLLARD	BOL
PLAQUE	PLQ
VEHICLE CROSSING	(VC)
PRAM CROSSING	(PC)
WINDOW	W
DOOR	D
HEAD/SILL	H/S
COMMUNICATIONS (DBYD)	C
ELECTRICITY (U'GROUND DBYD)	E
ELECTRICITY (OVERHEAD)	P
SEWER (DBYD)	S
WATER (DBYD)	W
GAS (DBYD)	G
STORMWATER PIPE	SW



NOTES

1. THE BOUNDARIES HAVE NOT BEEN MARKED ON GROUND
2. THE BOUNDARY SURVEY (DIMENSIONS AND AREA) HAVE BEEN SURVEYED IN ACCORDANCE WITH SURVEYING AND SPATIAL INFORMATION REGULATION 2017 CLAUSE 10 "IDENTIFICATION SURVEYS" AND ARE SUBJECT TO FINAL SURVEY
3. ADJOINING BOUNDARIES WITHIN THIS FILE HAVE BEEN ADDED FROM DCDB DATA OBTAINED FROM NSW LAND REGISTRY SERVICES AND ARE APPROXIMATE ONLY
4. ORIGIN OF **MGA2020** COORDINATES IS TAKEN FROM **SSM 489** - E.**334242.546**, N.**6262662.240** IN MELWOOD AVENUE
5. ORIGIN OF LEVELS ON A.H.D. IS TAKEN FROM **SSM 489** R.L. **126.683** (A.H.D.) IN MELWOOD AVENUE
6. CONTOUR INTERVAL **0.5m**
7. CONTOURS ARE INDICATIVE ONLY. ONLY SPOT LEVELS SHOULD BE USED FOR CALCULATIONS OF QUANTITIES WITH CAUTION
8. KERB LEVELS ARE TO THE TOP OF KERB UNLESS SHOWN OTHERWISE
9. FLOOR LEVELS SHOWN ARE THRESHOLD LEVELS. NO INVESTIGATION OF INTERNAL FLOOR LEVELS HAS BEEN UNDERTAKEN
10. NO INVESTIGATION OF UNDERGROUND SERVICES HAS BEEN MADE. SERVICES HAVE BEEN PLOTTED FROM RELEVANT AUTHORITIES INFORMATION AND HAVE NOT BEEN SURVEYED. ALL RELEVANT AUTHORITIES SHOULD BE NOTIFIED PRIOR TO ANY EXCAVATION ON OR NEAR THE SITE
11. 8/4.7 DENOTES TREE SPREAD OF 8m, TRUNK DIAMETER OF 0.4m & APPROX HEIGHT OF 7m
12. SHOWS APPROXIMATE POSITION OF ROAD LINEMARKING AND IS INDICATIVE ONLY
13. BEARINGS SHOWN ARE MGA (MAP GRID OF AUSTRALIA) ADD APPROX. 1°00' FOR TRUE NORTH

EASEMENTS & RESTRICTIONS

(A) RIGHT OF WAY (GOV GAZ DATED 24-6-1983 FOL 2925 & DP626916)
(B) EASEMENT FOR ELECTRICITY PURPOSES 2 WIDE (GOV GAZ DATED 24-6-1983 FOL 292 & DP626916)

COVENANTS AFFECTING WHOLE OF LOT 31 IN DP366454
- POSITIVE COVENANT (3933586)
- POSITIVE COVENANT (6795670)

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GDA2020

0 8 16 24 32 40
SCALE 1: 400 @ A1

Revision	Date	Description	Reference
H	00/00/00	–	00
G	00/00/00	–	00
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C	00/00/00	–	00
B	00/00/00	–	00
A	00/00/00	–	00

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Client CONSTRUCTION MANAGEMENT SERVICES

Drawing title
PLAN OF DETAIL AND LEVELS OVER LOT 2589 IN DP 752038 & LOT 31 IN DP 366454, KNOWN AS FORESTVILLE RSL, No.22 MELWOOD AVENUE, FORESTVILLE

datum	AHD	reference number	52165 002DT
site Area	9015m² (CALC)	scale	1: 400 @A1
LGA	NORTHERN BEACHES	date of survey	17/07/2024
		SHEET OF	1 / 11

MGA

TN

APPROX 1:00

No.18
1 STOREY
BRICK RESIDENCE
TILE ROOF

RIDGE 133.47

30
DP 366454

No.18 MELWOOD AVENUE - SOUTH ELEVATION

No.18 MELWOOD AVENUE - EAST ELEVATION

AVENUE

MELWOOD

1
DP 27471

No.23
2 STOREY
BRICK RESIDENCE
TILE ROOF

RIDGE 133.77

2
DP 27471

No.25
1 STOREY
BRICK RESIDENCE
TILE ROOF

RIDGE 130.98

98°32'50"
48.77

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0 2 4 6 8 10
SCALE 1:100 @ A1

SEE SHEET 1 FOR LEGEND & NOTES

ADJOINS SHEET 4

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site Area	9015m² (CALC)	scale	1:100 @A1
LGA	NORTHERN BEACHES	date of survey	17/07/2024
		SHEET	2 OF 11

MGA

TN

APPROX 1°00'

No.17
2 STOREY
BRICK RESIDENCE
TILE ROOF

RIDGE 136.18

SP 68546

No.17
2 STOREY
BRICK RESIDENCE
TILE ROOF

RIDGE 136.32

30
DP 366454

BRICK WALL

GARDEN

KERB

8°32'50"
18.9

BITUMEN
CARPARK

31
DP 366454

SPEED HUMP

BRICK WALL

PALING FENCE

98°34'50"
31.7

BRICK WALL

ELEVATION 1 - No.17 FORESTVILLE AVENUE

ELEVATION 2 - No.17 FORESTVILLE AVENUE

SHEET 4

GATE FENCE WIRE GATE CHAIN POST

2590
DP 752038

GRASS

2589
DP 752038

BITUMEN
CARPARK

CONCRETE
LOADING DOCK

CONCRETE PANEL WALL

PARAPET 136.50

2 STOREY
BRICK & RENDERED
BUILDING
"FORESTVILLE RSL"

GATE

BIN

ADJOINS

SEE SHEET 1 FOR LEGEND & NOTES

ADJOINS

SHEET 5

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SCALE 1:100 @ A1

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datum AHD
reference number 52165 002DT
site Area 9015m² (CALC)
scale 1:100 @A1
date of survey 17/07/2024
LGA NORTHERN BEACHES
SHEET 3 OF 11

ADJOINS

SHEET 2

SHEET 3

ADJOINS

SHEET 6

98°32'50"
48.77

BRICK

GARDEN

TOP

DF

KERB

WALL

BITUMEN CARPARK

31
DP 366454

GRASS

FOOTPATH

CONCRETE

CONCRETE DRIVEWAY

RENDERED WALL

AVENUE

2
DP 27471

No.25
1 STORIEY
BRICK RESIDENCE
TILE ROOF

RIDGE 130.98

3
DP 27471

No.27
1 STORIEY
BRICK RESIDENCE
TILE ROOF

RIDGE 130.93

MGA

TN

APPROX 1.00°

PALING

FENCE

2589
DP 752038

BUSHLAND

AVENUE

MELWOOD

SPEED HUMP

RAMMING

11
DP 626916

PAVED

REND

100
DP 867516

No.31
1 STORIEY
BRICK RESIDENCE
METAL ROOF

PARAPET 129.96

GATE

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SCALE 1:100 @ A1

Revision	Date	Description	Reference
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datum	AHD	reference number	52165 002DT
site Area	9015m² (CALC)	scale	1:100 @A1
date of survey	17/07/2024		
LGA	NORTHERN BEACHES	SHEET	4 OF 11

ADJOINS SHEET 3

MGA

TN

100 APPROX

2590
DP 752038

"FORESTVILLE COMMUNITY HALL"
2 STOREY
BRICK STRUCTURE
TILE ROOF
RIDGE 133.67

2597
DP 752038

2590
DP 752038

2 STOREY
BRICK & RENDERED
BUILDING
"FORESTVILLE RSL"

2589
DP 752038

8°32'50" 100.585

RIDGE 136.49

GUTTER 135.06

SHEET 6

ADJOINS

GATE
FENCE
GRASS
CONCRETE DRIVEWAY
METAL
GATE
RAMP
WALL
FENCE
DRIVEWAY
KERB
BITUMEN
GRASS
EDGE
BENCH
GRASS
BRICK
CONCRETE
METAL
BENCH
BENCH
BALCONY
BALCONY
AWNING
AWNING
CONCRETE
PATH
CONCRETE
EDGE
GRATED DRAIN
WALL
EDGE
PATH
RETAINING
CONCRETE
CONCRETE
CONCRETE
LAWN BOWL GREEN
LAWN BOWL GREEN

SEE SHEET 1 FOR LEGEND & NOTES

ADJOINS SHEET 7

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datum AHD
reference number 52165 002DT
site Area 9015m² (CALC)
scale 1:100 @A1
date of survey 17/07/2024
LGA NORTHERN BEACHES
SHEET 5 OF 11

ADJOINS

SHEET 4

SHEET 5

ADJOINS

SHEET 8

11
DP 626916

2589
DP 752038

100
DP 867516

5
DP 27471

1
DP 23758

AVENUE

MELWOOD

2 STOREY
BRICK & RENDERED
BUILDING
"FORESTVILLE RSL"

No.31
1 STOREY
BRICK RESIDENCE
METAL ROOF

No.33
2 STOREY
BRICK RESIDENCE
TILE ROOF

No.35
1 STOREY
BRICK RESIDENCE
TILE ROOF

REND SERVICE HUT

ANZAC MONUMENT

BENCHMARK
CUT IN KERB
RL. 125.76 (AHD)

BITUMEN CARPARK

PAVED

GRASS

GARDEN

CONCRETE

PATH

SYNTHETIC GRASS

LAWN BOWL GREEN

BALCONY

AWNING

RAMP

GUTTER 135.06

PARAPET 136.50

GLASS PANEL

RETAINING WALL

FOOTPATH

CONCRETE DRIVEWAY

FENCE

METAL

BRICK

EDGE

GATE

BENCH

FLAG

PLQ

RIDGE 131.65

RIDGE 129.48

PARAPET 129.96

MGA

TN

100 APPROX

SEE SHEET 1 FOR LEGEND & NOTES

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0 2 4 6 8 10

SCALE 1:100 @ A1

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datum	AHD
site Area	9015m² (CALC)
LGA	NORTHERN BEACHES
reference number	52165 002DT
scale	1:100 @A1
date of survey	17/07/2024
SHEET	6 OF 11

ADJOINS

SHEET 5

MGA

TN

100 APPROX

2589
DP 752038

LAWN BOWL GREEN

LAWN BOWL GREEN

DRIVEWAY

BITUMEN

SPEED HUMP

KERB

TOP

OF

EDGE

CONCRETE

GRASS

BENCH

BRICK

METAL

FENCE

WALL

RETAINING

CONCRETE PATH

AWNING

80.465 CONCRETE

278°34'50"

METAL

FENCE

GARDEN

GARDEN

CONCRETE

BLOCK

RETAINING

WALL

GRASS

GRASS

SUBSTATION

KERB

BITUMEN

SPEED HUMP

SPEED HUMP

DRIVEWAY

SPEED HUMP

GROUP OF SMALL TREES

WALL

CONCRETE

BITUMEN CARPARK

BITUMEN CARPARK

METAL

FENCE

2590
DP 752038

ADJOINS

SHEET 8

SEE SHEET 1 FOR LEGEND & NOTES

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GDA2020

0 2 4 6 8 10

SCALE 1:100 @ A1

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datum AHD | reference number 52165 002DT

site Area 9015m² (CALC) | scale 1:100 @A1 | date of survey 17/07/2024

LGA NORTHERN BEACHES | SHEET 7 OF 11

ADJOINS

SHEET 6

SHEET 7

ADJOINS

MELWOOD AVENUE

2589
DP 752038

2590
DP 752038

2
DP 23758

3
DP 23758

4
DP 23758

No.37
1 STOREY
BRICK RESIDENCE
TILE ROOF

No.41
1 STOREY
BRICK RESIDENCE
TILE ROOF

LAWN BOWL GREEN

SUBSTATION

BITUMEN CARPARK

SPEED HUMP

MGA

TN

APPROX 1:00

SEE SHEET 1 FOR LEGEND & NOTES

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GDA2020

0 2 4 6 8 10

SCALE 1:100 @ A1

Revision	Date	Description	Reference
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A	00/00/00	–	00

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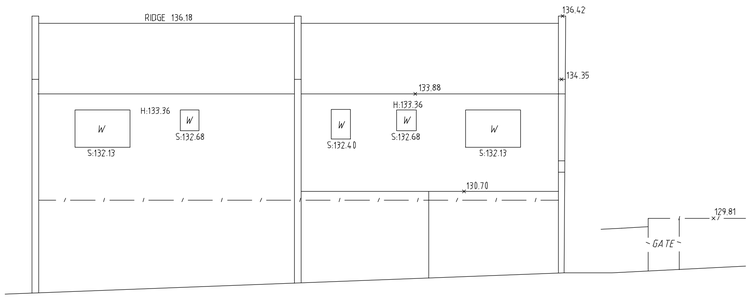
THIS IS THE PLAN REFERRED TO IN MY LETTER DATED:

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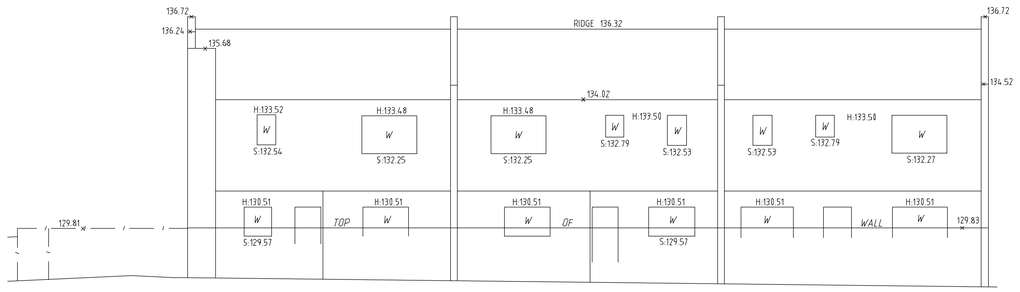
Client CONSTRUCTION MANAGEMENT SERVICES

Drawing title
PLAN OF DETAIL AND LEVELS OVER LOT 2589 IN DP 752038 & LOT 31 IN DP 366454, KNOWN AS FORESTVILLE RSL, No.22 MELWOOD AVENUE, FORESTVILLE

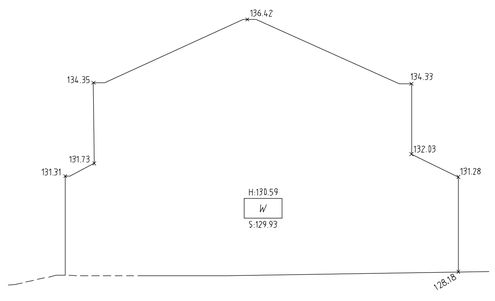
datum AHD
site Area 9015m² (CALC)
LGA NORTHERN BEACHES
reference number 52165 002DT
scale 1:100 @A1
date of survey 17/07/2024
SHEET 8 OF 11



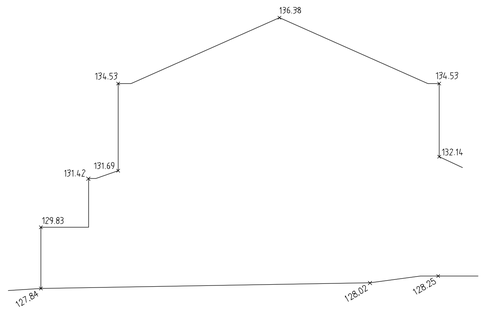
ELEVATION No.1 - 17 FORESTVILLE AVENUE



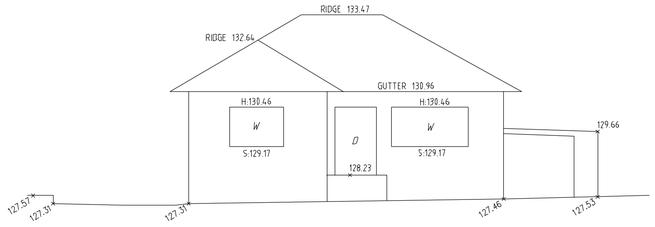
ELEVATION No.2 - 17 FORESTVILLE AVENUE



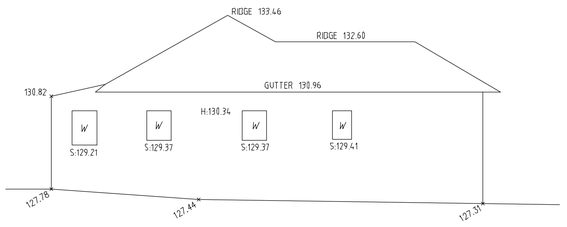
EAST ELEVATION - No.17 FORESTVILLE AVENUE LOT A



EAST ELEVATION - No.17 FORESTVILLE AVENUE LOT B



EAST ELEVATION - No.18 MELWOOD AVENUE



SOUTH ELEVATION - No.18 MELWOOD AVENUE

BEFORE YOU DIG www.byda.com.au Zero Damage - Zero Harm

GDA2020

SEE SHEET 1 FOR LEGEND & NOTES

0 2 4 6 8 10

SCALE 1:100 @ A1

Revision	Date	Description	Reference
H	00/00/00	–	00
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C	00/00/00	–	00
B	00/00/00	–	00
A	00/00/00	–	00

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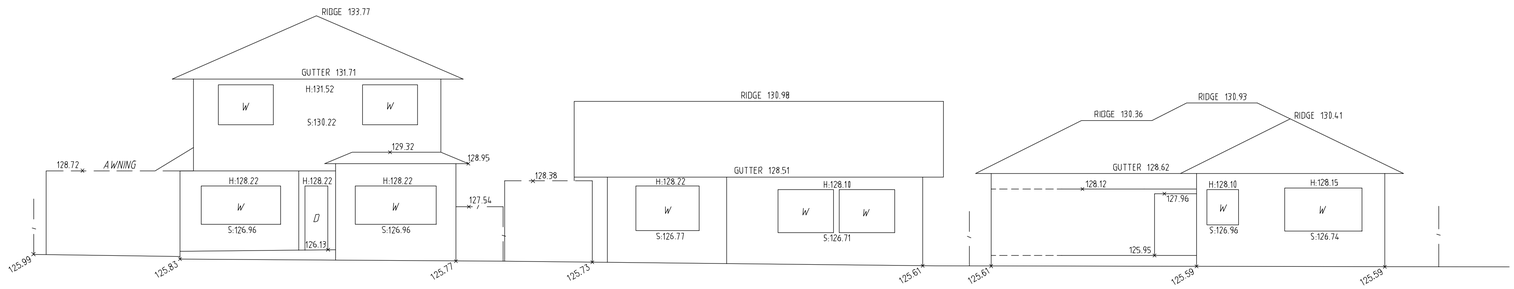
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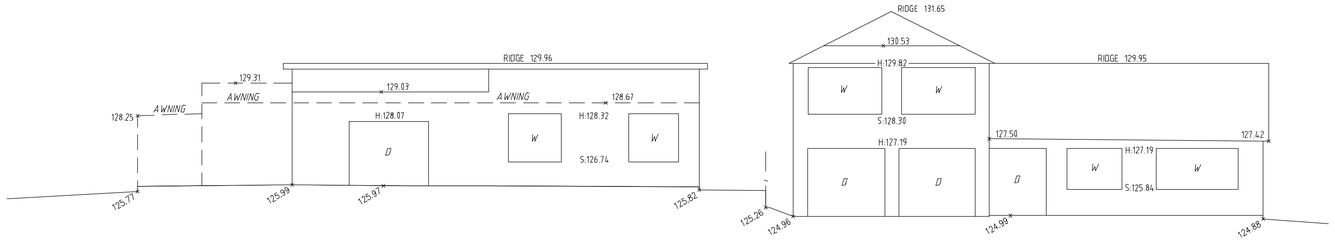
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datum AHD
reference number 52165 002DT
site Area 9015m² (CALC)
scale 1:100 @A1
date of survey 17/07/2024
LGA NORTHERN BEACHES
SHEET 9 OF 11



WEST ELEVATION - No.23-27 MELWOOD AVENUE



WEST ELEVATION - No.31-33 MELWOOD AVENUE

SEE SHEET 1 FOR LEGEND & NOTES

Revision	Date	Description	Reference
H	00/00/00	–	00
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SCALE 1:100 @ A1

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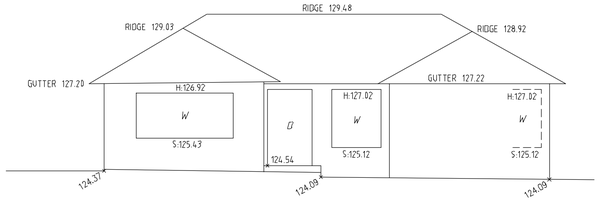
Registered Surveyor NSW

Client CONSTRUCTION MANAGEMENT SERVICES

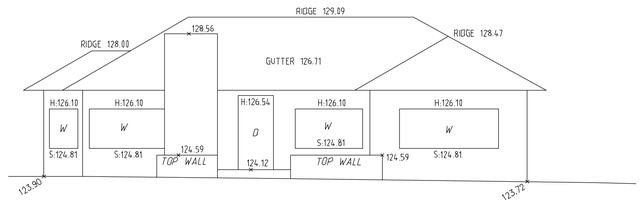
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datum AHD | reference number 52165 002DT
site Area 9015m² (CALC) | scale 1:100 @A1 | date of survey 17/07/2024
LGA NORTHERN BEACHES | SHEET 10 OF 11

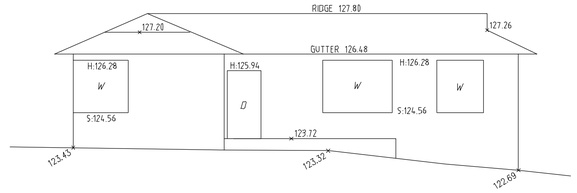
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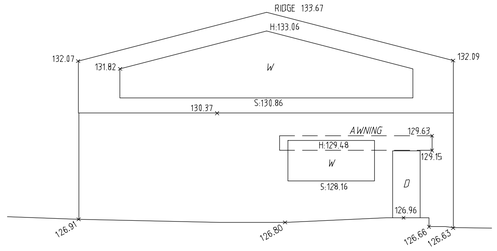
WEST ELEVATION - No.35 MELWOOD AVENUE



WEST ELEVATION - No.37 MELWOOD AVENUE



WEST ELEVATION - No.41 MELWOOD AVENUE



EAST ELEVATION - FORESTVILLE COMMUNITY HALL

SEE SHEET 1 FOR LEGEND & NOTES

0 2 4 6 8 10
SCALE 1:100 @ A1

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reference number 52165 002DT
scale 1:100 @A1
date of survey 17/07/2024
SHEET 11 OF 11

N

FORESTVILLE RSL REDEVELOPMENT

LOT 2589 & LOT 31
DP752038 & DP 366454
22 MELWOOD AVE, FORESTVILLE NSW 2087

1. MASTERPLAN SET - SITE ANALYSIS

2. CLUB AND SENIORS LIVING - ADG / SHDG ANALYSIS
3. SENIORS LIVING - 3 X BUILDINGS - ADG / SHDG ANALYSIS
4. ADG SOLAR STUDY
5. SENIORS LIVING APARTMENT LAYOUTS



01 EASTERN BUILDING ELEVATION - MELWOOD AVENUE
scale 1:200

DA

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G	5/05/2025	DA RESUBMISSION	pjh

CLIENT
FORESTVILLE RSL

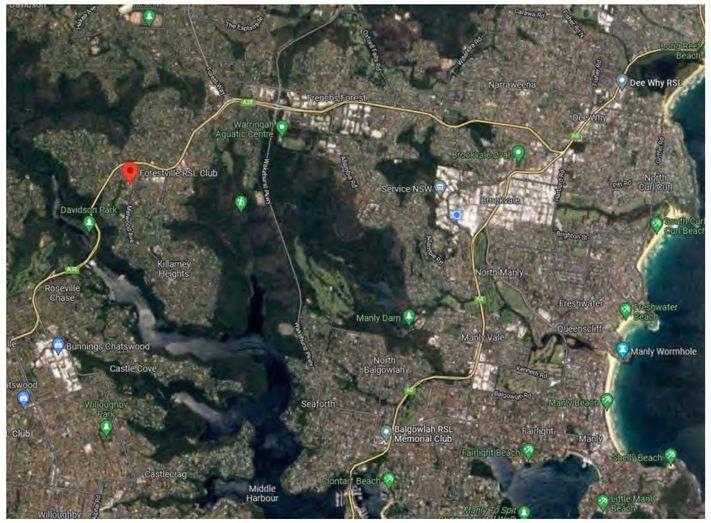
PROJECT
CLUB REDEVELOPMENT
22 MELWOOD AVE
LOT 2589 & LOT 31
DP752038 & DP 366454

DRAWING
COVER SHEET

MASTERPLAN SET

DRAWN	DATE	CHKD
AL	20/04/2023	PH
PROJECT #	SHEET #	REVISION #
22-0716	DA_A_000	G

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01 REGIONAL MAP
scale 1:NTS



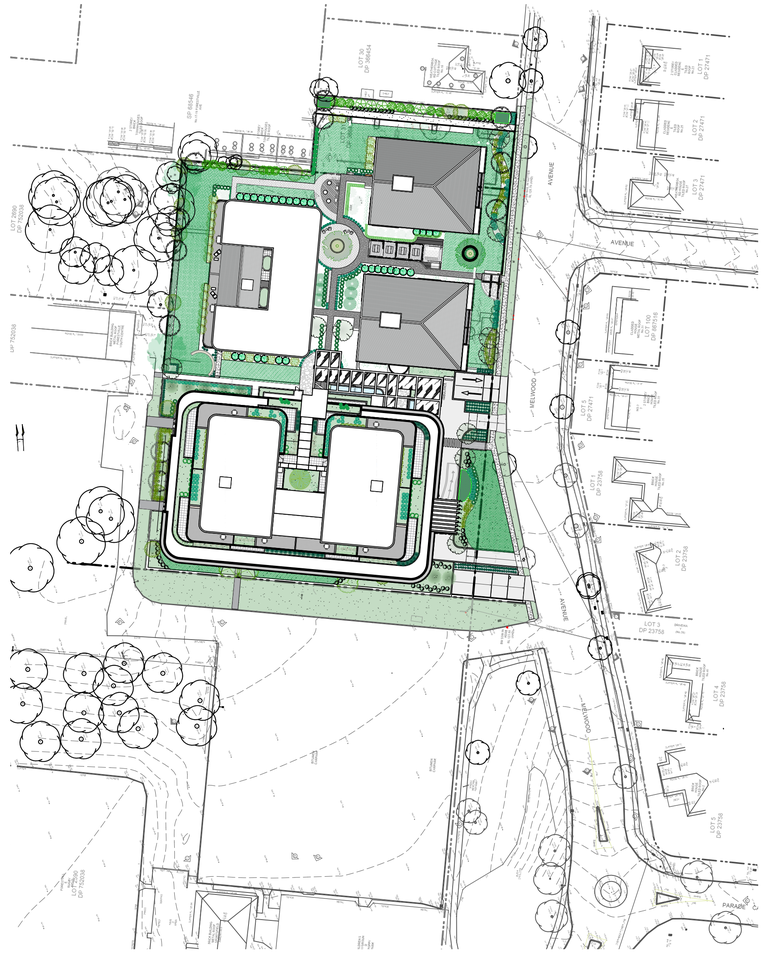
03 LOCAL MAP
scale 1:NTS

Documentation	Required information	Provided	
		Yes (✓)	No (x)
Site location	Broad map or aerial photo showing site location in relation to surrounding centres, shops, civic/community facilities and transport	✓	
Aerial photograph	Colour aerial photographs of site in its context	✓	
Local context plan	Plan(s) of the existing features of the wider context including adjoining properties and the other side of the street, that show:	✓	
	• pattern of buildings, proposed building envelopes, setbacks and subdivision pattern	✓	
	• land use and building typologies of adjacent and opposite buildings in the street	✓	
	• movement and access for vehicles, servicing, pedestrians and cyclists	✓	
	• topography, landscape, open spaces and vegetation	✓	
	• significant views to and from the site	✓	
	• significant noise sources in the vicinity of the site, particularly vehicular traffic, train, aircraft and industrial noise	✓	

02 PRE-DA REQUIREMENTS
scale 1:-



04 SITE PLAN PHOTO EXISTING
scale 1:750



05 PROPOSED SITE PLAN
scale 1:750

N

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CLIENT
FORESTVILLE RSL

PROJECT
CLUB REDEVELOPMENT
22 MELWOOD AVE
LOT 2589 & LOT 31
DP752038 & DP 366454

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DRAWING
REGIONAL SITE PLAN

Scale at A1 1:750
Scale at A3 1:1500
0m 5 10 25 50 60

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MASTERPLAN SET

DRAWN	DATE	CHKD
AL	20/04/2023	PH
PROJECT #	SHEET #	REVISION #
22-0716	DA_A_047	G

Documentation	Required information	Provided	
		Yes (✓)	No (x)
Site context and survey plan	Plan(s) of the existing site based on a survey drawing showing the features of the immediate site including:	✓	
	• boundaries, site dimensions, site area, north point	✓	
	• topography, showing relative levels and contours at 0.5 metre intervals for the site and across site boundaries where level changes exist, any unique natural features such as rock outcrops, watercourses, existing cut or fill, adjacent streets and sites	✓	
	• location and size of major trees on site and relative levels where relevant, on adjacent properties and street trees	✓	
	• location and use of existing buildings or built features on the site	✓	
	• location and important characteristics of adjacent public, communal and private open spaces	✓	
	• location and height of existing windows, balconies, walls and fences on adjacent properties facing the site, as well as parapet and ridge lines	✓	
	• pedestrian and vehicular access points, driveways and features such as service poles, bus stops, fire hydrants etc.	✓	
	• location of utility services, including easements and drainage	✓	
	• location of any other relevant features	✓	

01 PRE-DA REQUIREMENTS
scale 1:-



02 EXISTING RSL CLUB PHOTO
scale 1:-



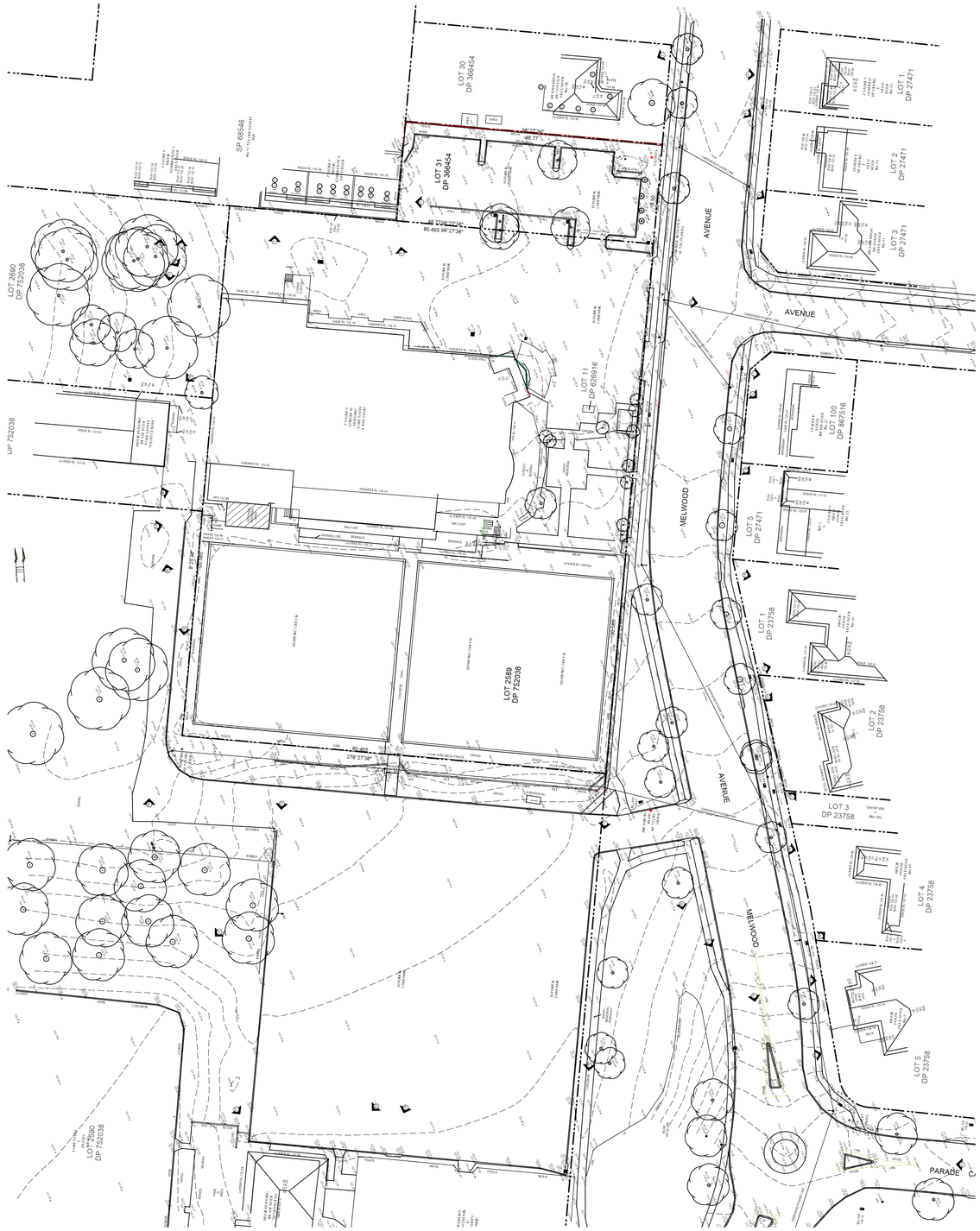
03 FORESTVILLE YOUTH CENTRE PHOTO
scale 1:-



04 EXISTING RSL CLUB ENTRY PHOTO
scale 1:-



05 MELWOOD AVENUE PHOTO
scale 1:-



01 SITE SURVEY
scale 1:500

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G	5/05/2025	DA RESUBMISSION	pjh

CLIENT
FORESTVILLE RSL

PROJECT
CLUB REDEVELOPMENT
22 MELWOOD AVE
LOT 2589 & LOT 31
DP752038 & DP 366454

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DRAWING
SURVEY & SURROUNDINGS

Scale at A1 1:500
Scale at A3 1:1000
0m 5 10 25 40

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MASTERPLAN SET

DRAWN	DATE	CHKD
AL	20/04/2023	PH
PROJECT #	SHEET #	REVISION #
22-0716	**DA_A_048**	**G**

N


PHOTOGRAPH LOCATION 1
17-19 FORESTVILLE AVE


PHOTOGRAPH LOCATION 2
17-19 FORESTVILLE AVE


PHOTOGRAPH LOCATION 3
17-19 FORESTVILLE AVE


PHOTOGRAPH LOCATION 4
17-19 FORESTVILLE AVE


PHOTOGRAPH LOCATION 5
17-19 FORESTVILLE AVE


PHOTOGRAPH LOCATION 6
No.18 MELWOOD AVE


PHOTOGRAPH LOCATION 7
No.23 MELWOOD AVE


PHOTOGRAPH LOCATION 8


PHOTOGRAPH LOCATION 9
No.27 MELWOOD AVE


PHOTOGRAPH LOCATION 10
INTERSECTION BUSHLAND AVE


PHOTOGRAPH LOCATION 11
No.31 MELWOOD AVE


PHOTOGRAPH LOCATION 12
No.31 MELWOOD AVE


PHOTOGRAPH LOCATION 13
No.33 MELWOOD AVE


PHOTOGRAPH LOCATION 14
No.35 MELWOOD AVE


PHOTOGRAPH LOCATION 15
No.35 MELWOOD AVE


PHOTOGRAPH LOCATION 16
No.37 MELWOOD AVE


PHOTOGRAPH LOCATION 17
No.37 MELWOOD AVE


PHOTOGRAPH LOCATION 18
No.41 MELWOOD AVE


PHOTOGRAPH LOCATION 19
No.41 MELWOOD AVE


PHOTOGRAPH LOCATION 20
No.2 CANNONS PARADE


PHOTOGRAPH LOCATION 21
No.2 CANNONS PARADE


PHOTOGRAPH LOCATION 22


PHOTOGRAPH LOCATION 23


PHOTOGRAPH LOCATION 24


PHOTOGRAPH LOCATION 25


PHOTOGRAPH LOCATION 26


PHOTOGRAPH LOCATION 27


PHOTOGRAPH LOCATION 28


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PHOTOGRAPH LOCATION 34


PHOTOGRAPH LOCATION 35


PHOTOGRAPH LOCATION 36


PHOTOGRAPH LOCATION 37


PHOTOGRAPH LOCATION 38


PHOTOGRAPH LOCATION 39


PHOTOGRAPH LOCATION 40


PHOTOGRAPH LOCATION 41
FORESTVILLE YOUTH CENTRE

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FORESTVILLE RSL

PROJECT
CLUB REDEVELOPMENT
22 MELWOOD AVE
LOT 2589 & LOT 31
DP752038 & DP 366454

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DRAWING
SURVEY PHOTOS

MASTERPLAN SET

DRAWN	DATE	CHKD
AL	20/04/2023	PH

PROJECT #	SHEET #	REVISION #
22-0716	**DA_A_049**	**G**

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SITE ANALYSIS

SENIORS HOUSING

RESIDENTIAL FLAT BUILDING
APARTMENT DESIGN GUIDE
SENIORS HOUSING GUIDE 2023

3.1 FLOOR TO FLOOR HEIGHT
BOUNDARY SETBACKS 9 mtrs
BUILDING SEPARATION 12mtrs
BUILDING MAX SIZE 20m X 40m

EXISTING CLUB TO MAINTAIN TRADING WHILST NEW CLUB CONSTRUCTED

EXISTING BUILDING LINE RESIDENTIAL NEIGHBOURS

MAINTAIN ACCESS FOR NEIGHBOURS

SPACE AVAILABLE FOR 3 X SENIORS BUILDINGS

PLANNING

R 2 ZONE
HOUSING SEPP
9.5 MTR HEIGHT LIMIT WITH 11.5MTR MAX ALLOWED FOR SERVICING EQUIPMENTS

8.5 MTR HEIGHT LIMIT
FOR THE CLUB FROM THE LEP

SITE AREA = 9,014m^2

EASIL ELOPED PORTION OF SITE

GREAT VEHICULAR ACCESS OFF MELWOOD AVE

IONAL VIEWS

COLD WINTER WINDS

COLD WINTER WINDS

COOL SUMMER WINDS

WINTER SUN

SUMMER SUN

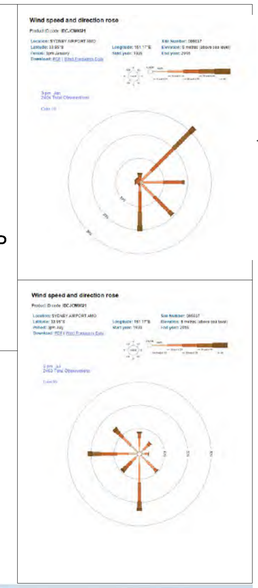
AVENUE

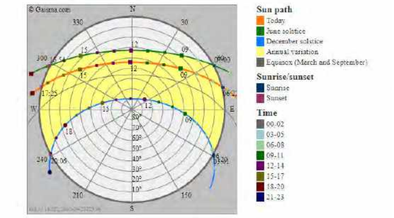
MELWOOD

BUSHLAND

Documentation	Required information	Provided	
		Yes (✓)	No (x)
Streetscape elevations and sections	Photographs or drawings of the site in relation to the streetscape and along both sides of any street that the development fronts, that show:		
	• overall height (storeys, metres) and important parapet/datum lines of adjacent buildings		
	• patterns of building frontage, street setbacks and side setbacks		
	• planned heights		
Analysis	Plan that synthesises and interprets the context, streetscape and site documentation into opportunities and constraints that generate design parameters, including the following information:		
	• orientation and any overshadowing of the site and adjoining properties by neighbouring structures (excludes vegetation). The winter sun path should also be shown between 9 am and 3 pm on 21 June		
	• identification of prevailing wind	✓	
	• the geotechnical characteristics of the site and suitability of the proposed development	✓	
	• the public domain interface and street setback	✓	
	• relationship to and interface with adjacent properties, including side and rear setbacks	✓	
	• ventilation for the subject site and immediate neighbours	✓	
	• proposed building footprint location		
	• retained and proposed significant trees and deep soil zones		
	• proposed communal open space		
	• proposed car park footprint and depth		
	• proposed building entries		
	• supporting written material - this should include technical advice from specialists involved in the development process including landscape architects, arborists, geotechnical engineers and/or contamination specialists where applicable	✓	

01 SITE ANALYSIS
scale 1:500





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FORESTVILLE RSL

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CLUB REDEVELOPMENT
22 MELWOOD AVE
LOT 2589 & LOT 31
DP752038 & DP 366454

DRAWING
SITE ANALYSIS

Scale at A1 1:500
Scale at A3 1:1000
0m 5 10 25 40

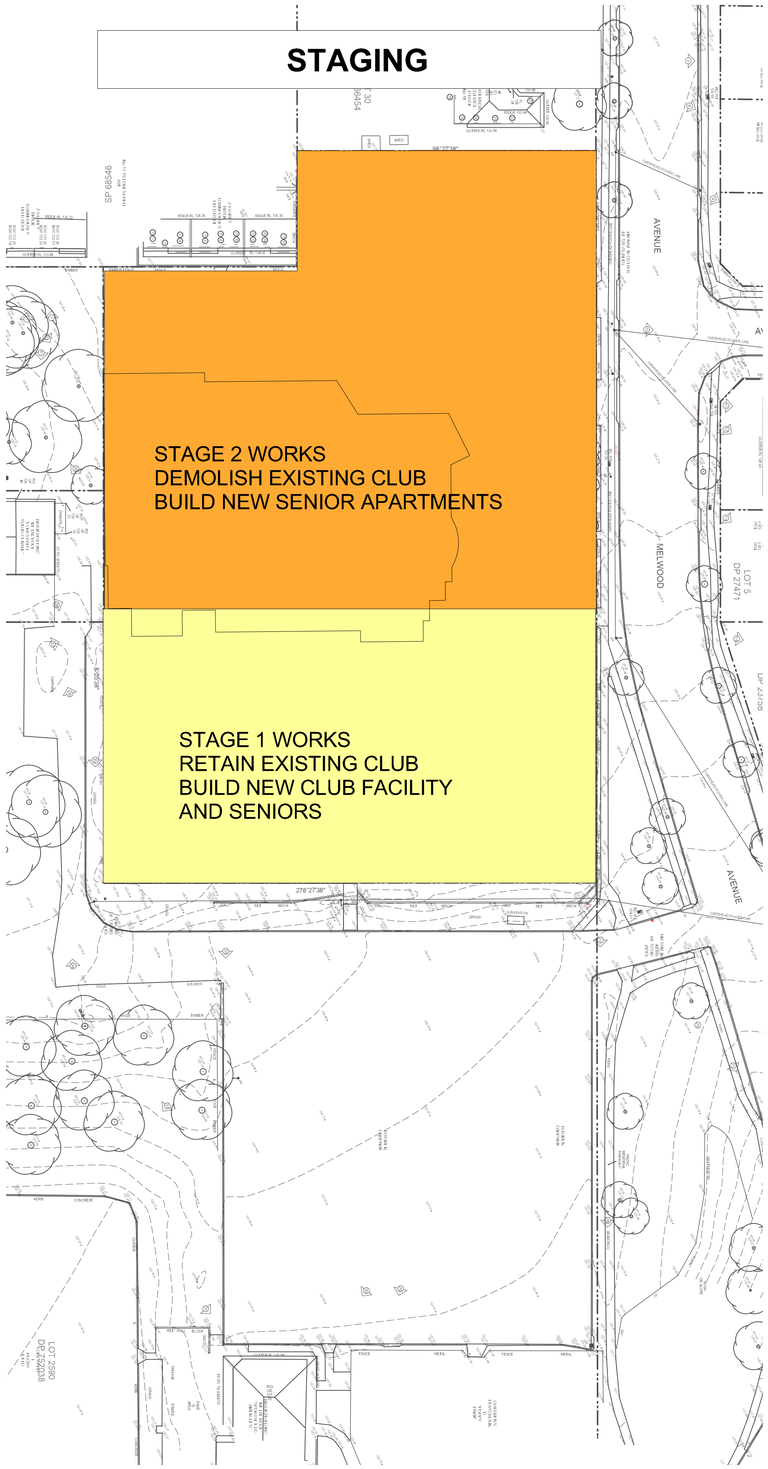
Figured dimensions shall take precedence over scale. Contractors must verify all dimensions on job before commencing any work or making shop drawings.

MASTERPLAN SET

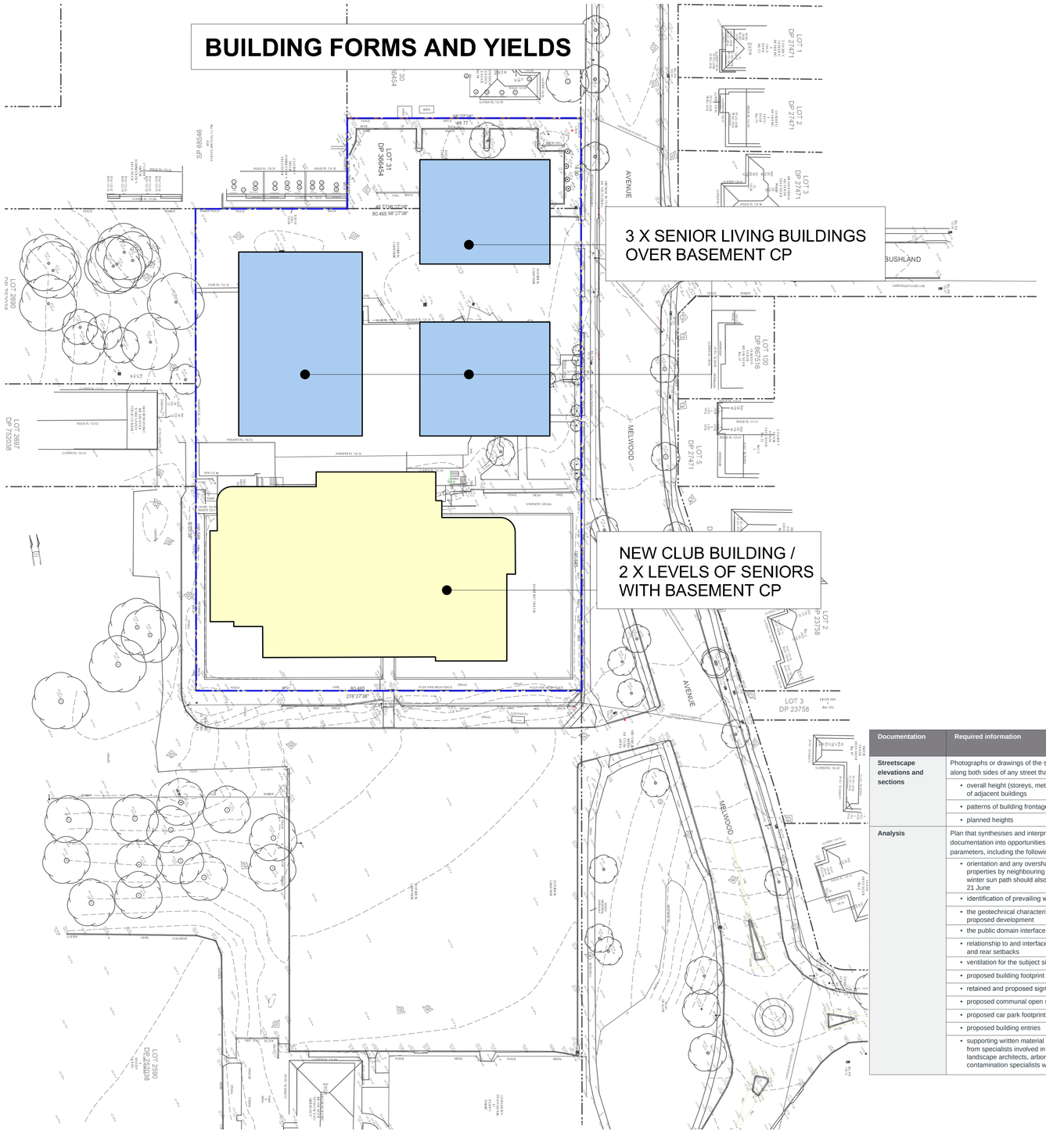
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AL	20/04/2023	PH
PROJECT #	SHEET #	REVISION #
22-0716	DA_A_050	G

N

STAGING



BUILDING FORMS AND YIELDS



Documentation	Required information	Provided	
		Yes (✓)	No (x)
Streetscape elevations and sections	Photographs or drawings of the site in relation to the streetscape and along both sides of any street that the development fronts, that show:		
	• overall height (storeys, metres) and important parapet/datum lines of adjacent buildings		
	• patterns of building frontage, street setbacks and side setbacks		
	• planned heights		
Analysis	Plan that synthesises and interprets the context, streetscape and site documentation into opportunities and constraints that generate design parameters, including the following information:		
	• orientation and any overshadowing of the site and adjoining properties by neighbouring structures (excludes vegetation). The winter sun path should also be shown between 9 am and 3 pm on 21 June		
	• identification of prevailing wind		
	• the geotechnical characteristics of the site and suitability of the proposed development		
	• the public domain interface and street setback	✓	
	• relationship to and interface with adjacent properties, including side and rear setbacks	✓	
	• ventilation for the subject site and immediate neighbours	✓	
	• proposed building footprint location	✓	
	• retained and proposed significant trees and deep soil zones		
	• proposed communal open space		
	• proposed car park footprint and depth		
	• proposed building entries		
	• supporting written material - this should include technical advice from specialists involved in the development process including landscape architects, arborists, geotechnical engineers and/or contamination specialists where applicable		

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PROJECT
CLUB REDEVELOPMENT
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SITE ANALYSIS

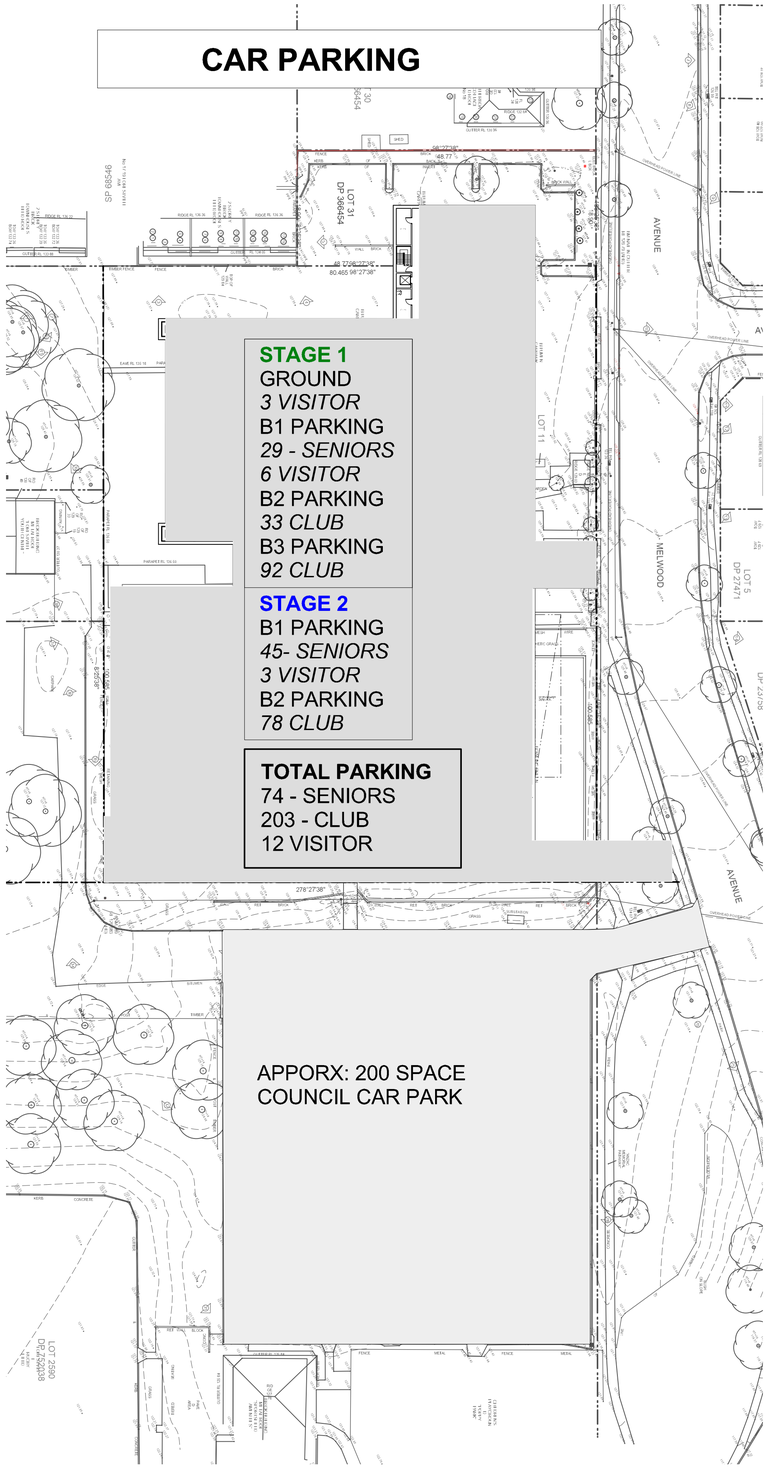
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0m 5 10 25 40

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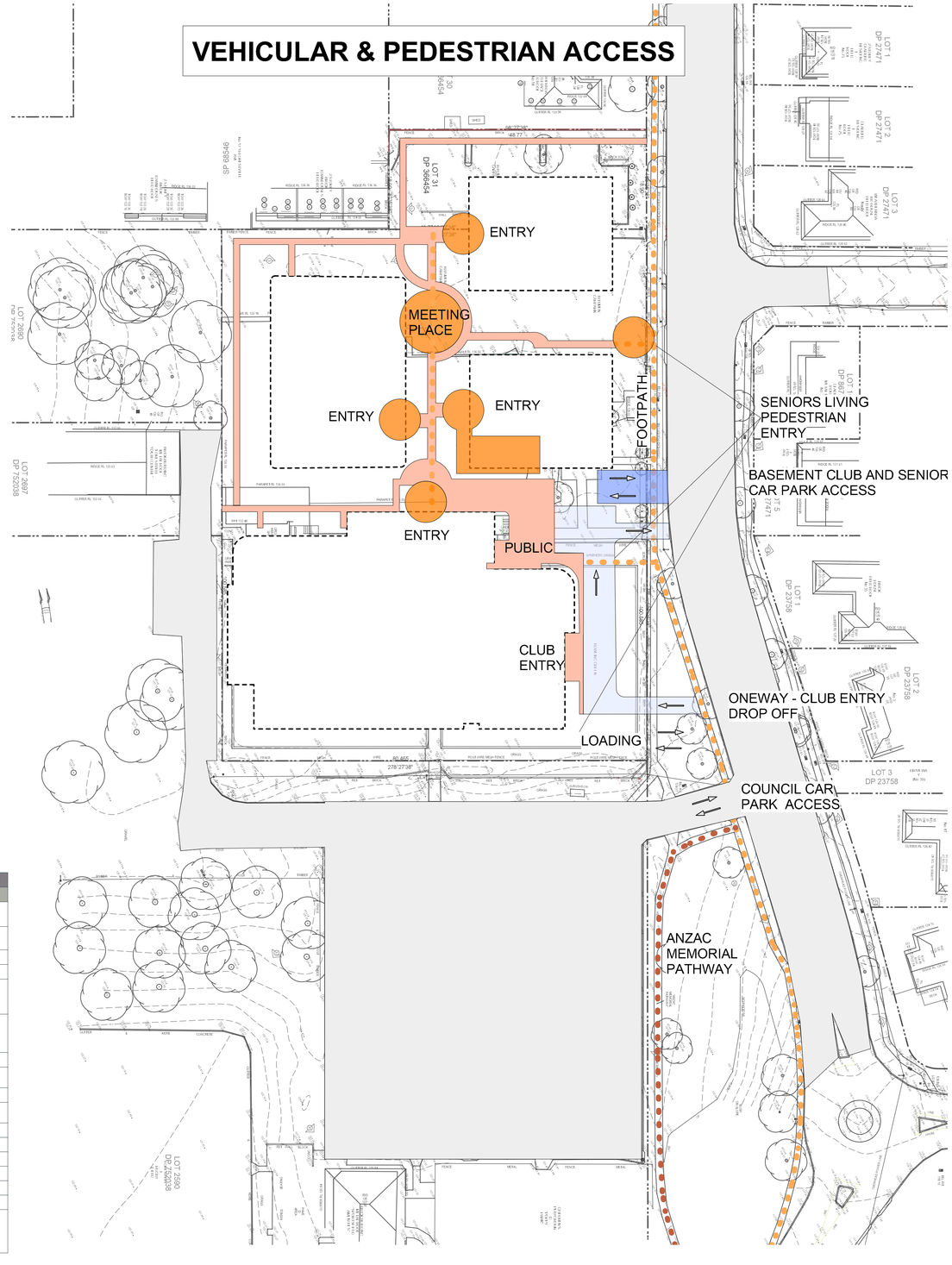
MASTERPLAN SET

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AL	20/04/2023	PH
PROJECT #	SHEET #	REVISION #
22-0716	**DA_A_051**	**G**

CAR PARKING



VEHICULAR & PEDESTRIAN ACCESS



Documentation	Required information	Provided	
		Yes (✓)	No (x)
Streetscape elevations and sections	Photographs or drawings of the site in relation to the streetscape and along both sides of any street that the development fronts, that show:		
	• overall height (storeys, metres) and important parapet/datum lines of adjacent buildings		
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	• the public domain interface and street setback		
	• relationship to and interface with adjacent properties, including side and rear setbacks		
	• ventilation for the subject site and immediate neighbours		
	• proposed building footprint location		
	• retained and proposed significant trees and deep soil zones		
	• proposed communal open space		
	• proposed car park footprint and depth	✓	
	• proposed building entries	✓	
	• supporting written material - this should include technical advice from specialists involved in the development process including landscape architects, arborists, geotechnical engineers and/or contamination specialists where applicable		

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DRAWING
SITE ANALYSIS - CAR PARKING

Scale at A1 1:500
Scale at A3 1:1000
0m 5 10 25 40

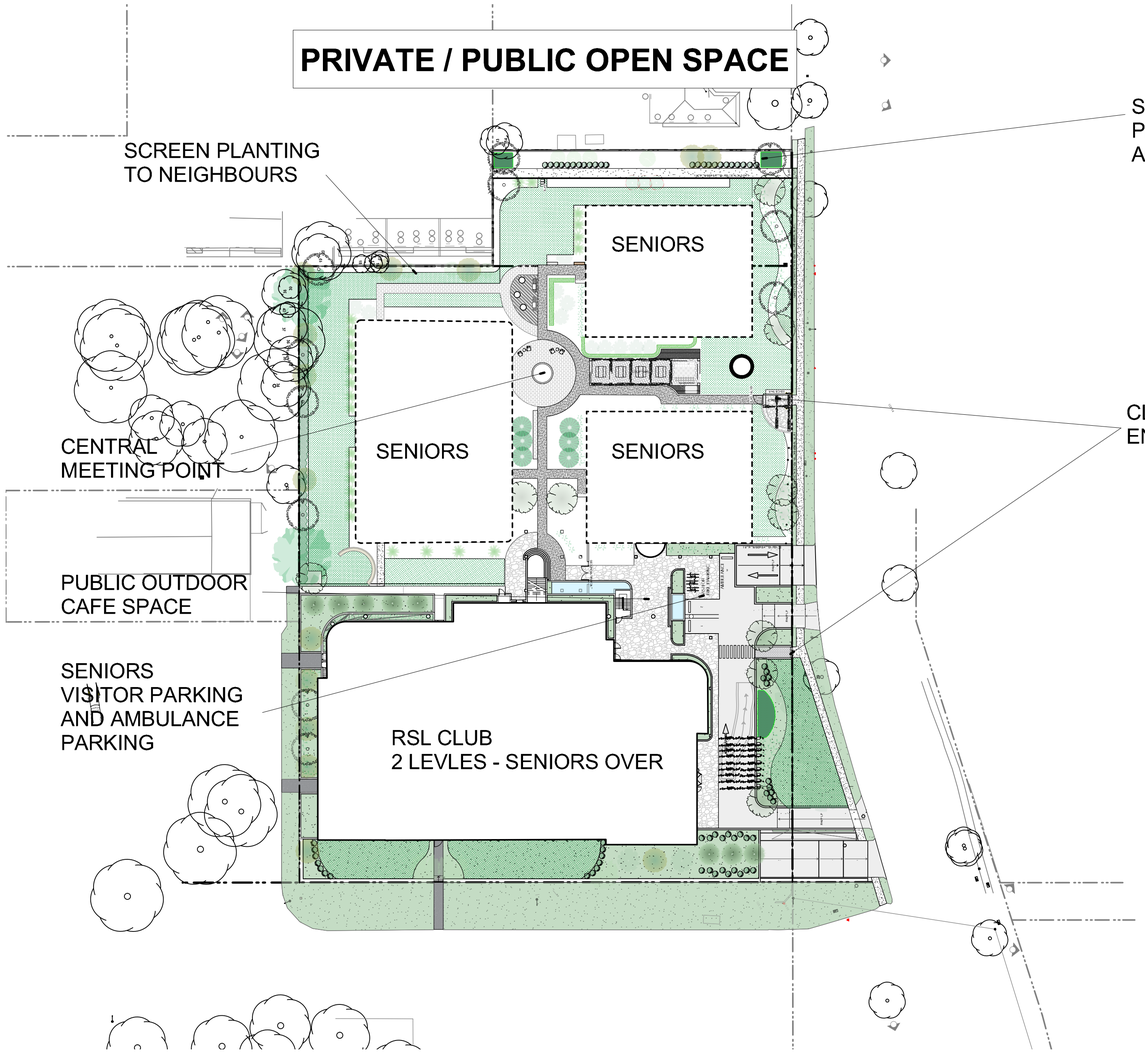
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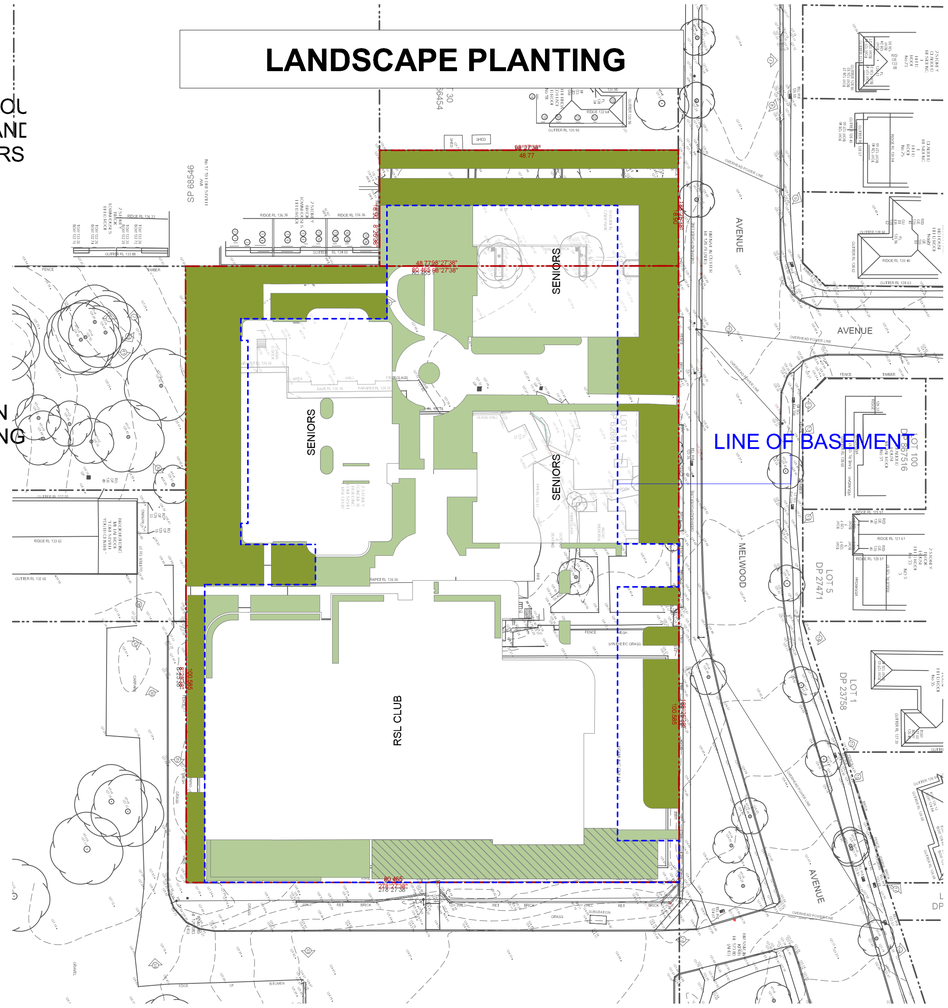
PRIVATE / PUBLIC OPEN SPACE



SCREEN PLANTING TO NEIGHBOU
PROVISION OF FENCE / GATE AND
ACCESS PATH FOR NEIGHBOURS

CLEARLY DEFINED PEDESTRIAN
ENTRY POINTS AND WAY FINDING

LANDSCAPE PLANTING



Documentation	Required information	Provided	
		Yes (✓)	No (x)
Analysis	Plan that synthesises and interprets the context, streetscape and site documentation into opportunities and constraints that generate design parameters, including the following information:		
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	• ventilation for the subject site and immediate neighbours		
	• proposed building footprint location		
	• retained and proposed significant trees and deep soil zones	✓	
	• proposed communal open space	✓	
	• proposed car park footprint and depth		
	• proposed building entries		
	• supporting written material - this should include technical advice from specialists involved in the development process including landscape architects, arborists, geotechnical engineers and/or contamination specialists where applicable		

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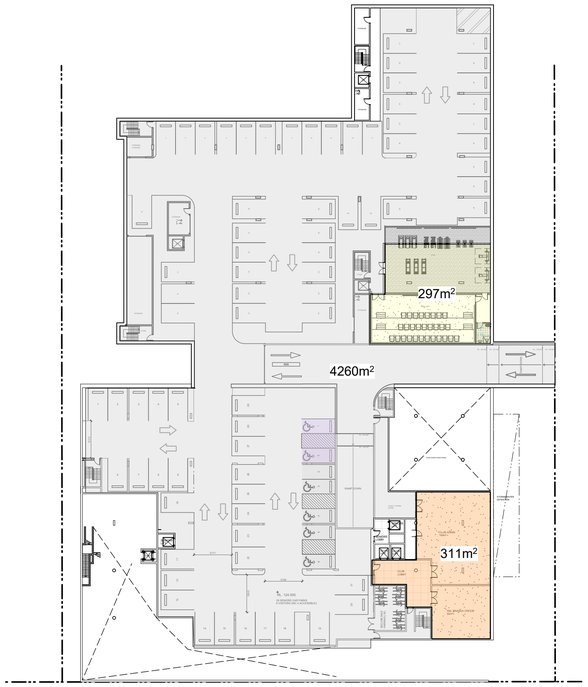
DRAWING
SITE ANALYSIS - OPEN SPACE

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Scale at A3 1:1000
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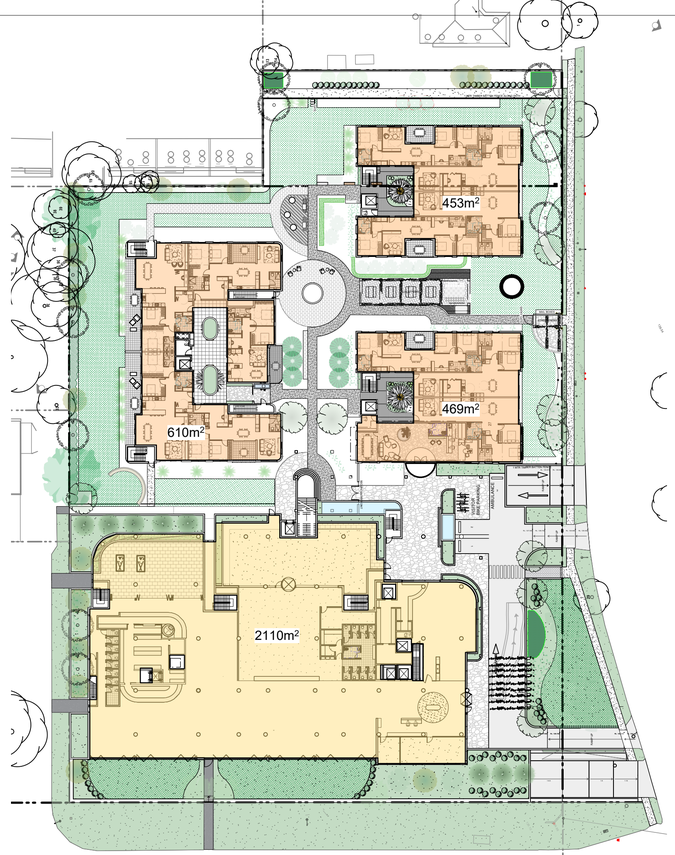
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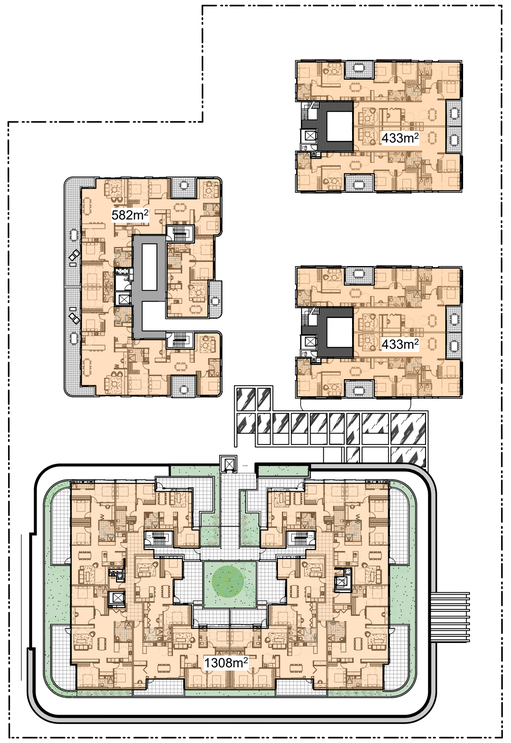


02 AREA CALCULATIONS - BASEMENT 1
scale 1:500

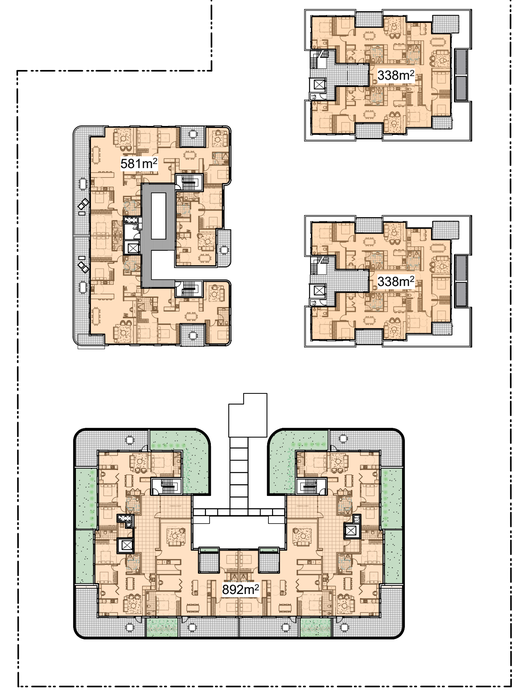


2084 m²

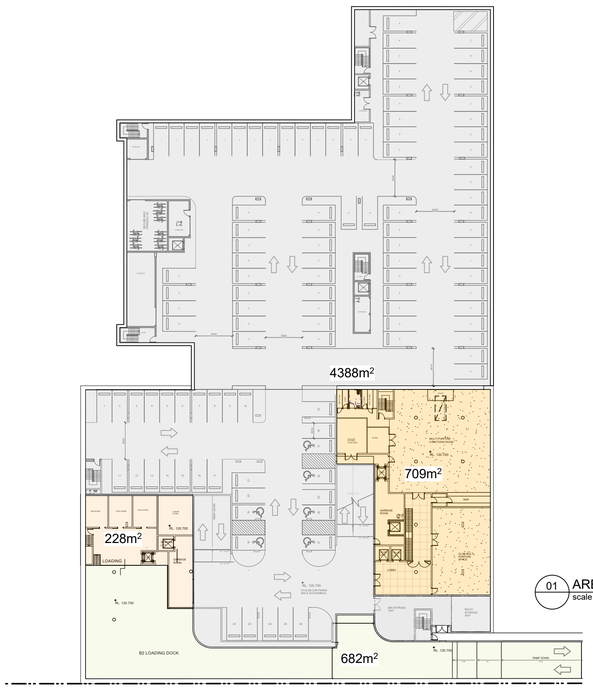
03 AREA CALCULATIONS - GROUND FLOOR
scale 1:500



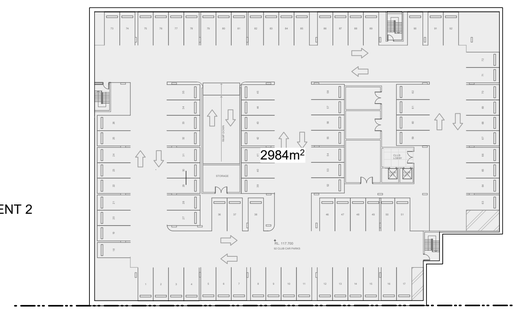
04 AREA CALCULATIONS - LEVEL 1
scale 1:500



05 AREA CALCULATIONS - LEVEL 2
scale 1:500



01 AREA CALCULATIONS - BASEMENT 2
scale 1:500



06 AREA CALCULATIONS - BASEMENT 3
scale 1:500

Forestville RSL - Building AREAS	GFA	
	m2	FSR
SITE AREA	9014	
SENIOR TOTAL GFA	6669	0.753:1
CLUB AREA GFA	3358	0.31:1
TOTAL	10027	1:07
Club Building		
	GFA	
B 2	937	
B1	311	
G	2110	
	3358	
Retirement Living - Club	GFA	
1	1308	
2	892	
	2200	
Retirement Living - Building 1 - GFA	GFA	
B1	232	
G	453	
1	433	
2	338	
	1456	
Retirement Living - Building 2	GFA	
G	469	
1	433	
2	338	
	1240	
Retirement Living - Building 3	GFA	
G	610	
1	582	
2	581	
	1773	

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DP752038 & DP 366454

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DRAWING
SITE ANALYSIS - AREA CALCS

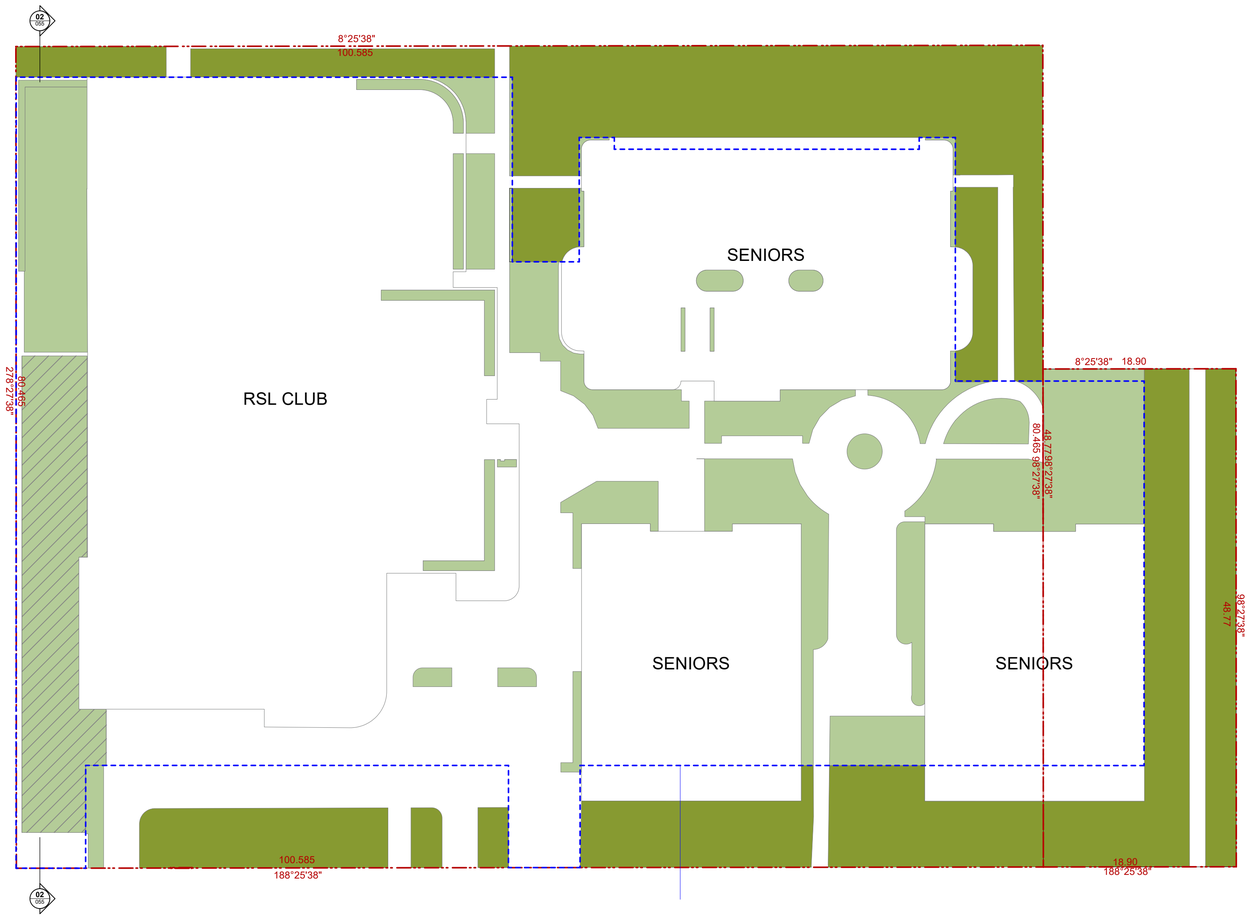
MASTERPLAN SET

Scale at A1 1:500
Scale at A3 1:1000
0m 5 10 25 40

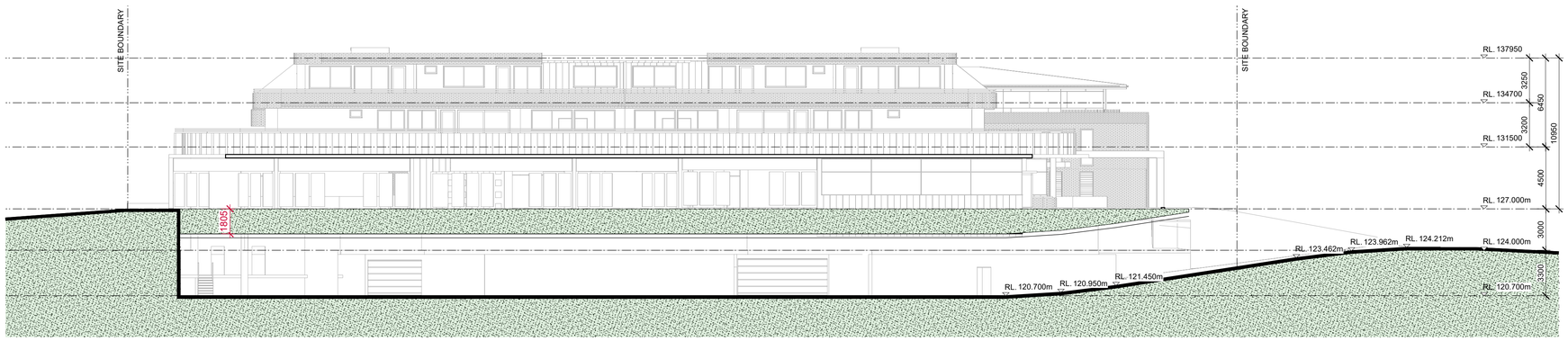
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N



01 SITE PLAN - LANDSCAPING
scale 1:300



02 CLUB SECTION - LANDSCAPING
scale 1:200

SITE AREA
9014sqm

DEEP SOIL
(3m) 1740sqm

PLANTING
1617sqm

TOTAL
3357sqm

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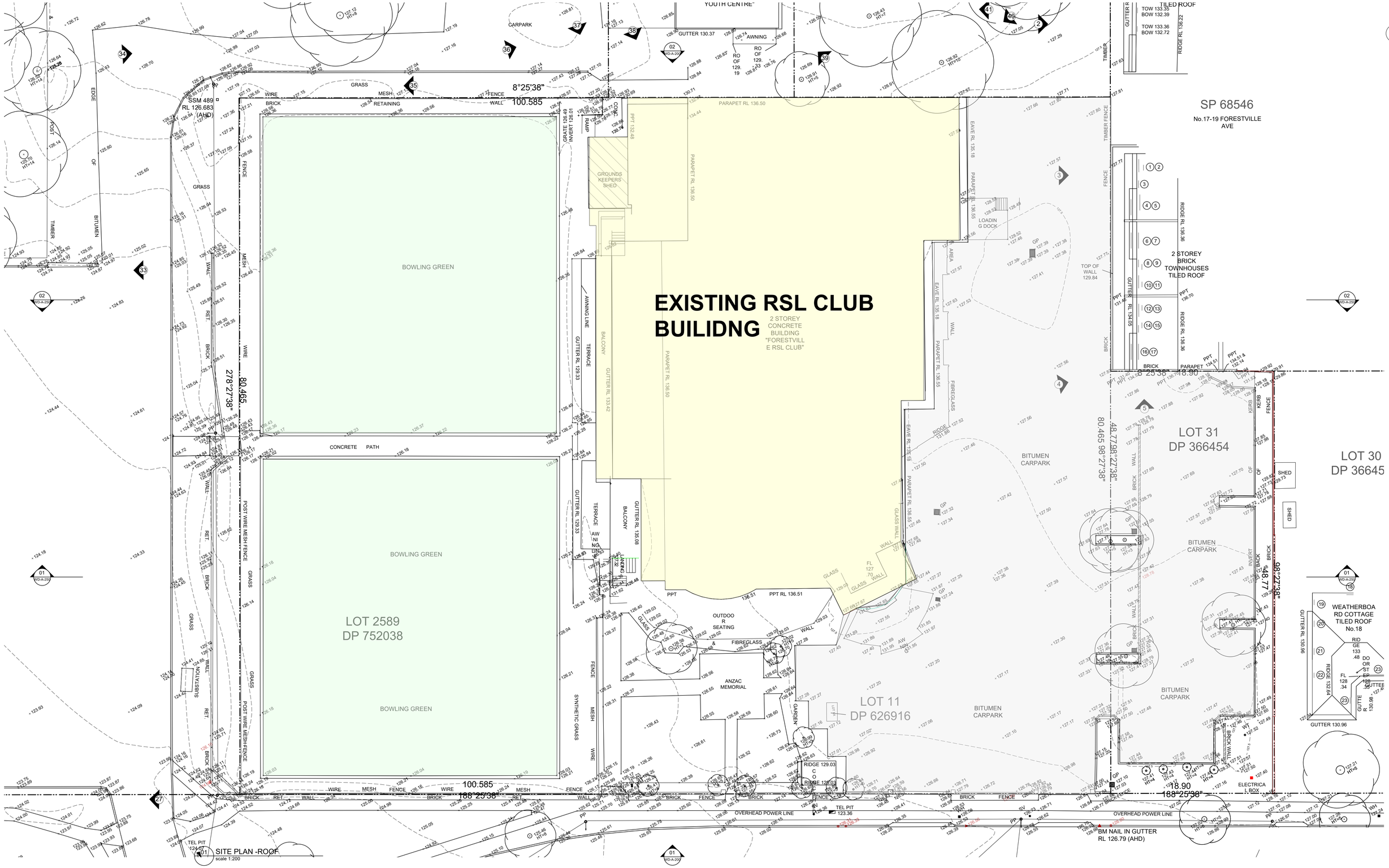
DRAWING
SITE ANALYSIS - LANDSCAPING

Scale at A1 1:200
Scale at A3 1:400
0m 2.5 5 10 15 16

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MASTERPLAN SET

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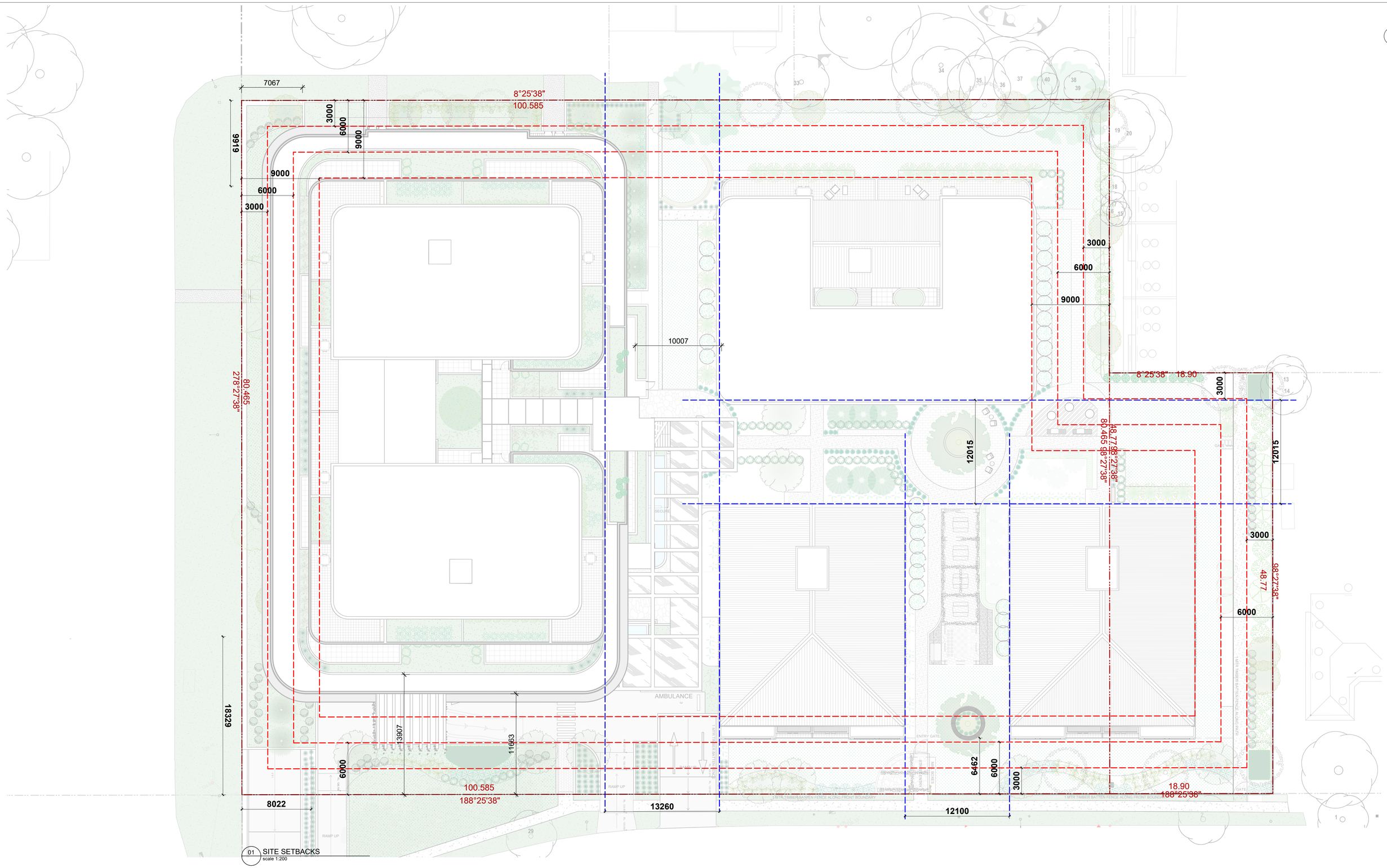
DRAWING
SITE PLAN - EXISTING

MASTERPLAN SET

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Scale at A3 1:400
0m 2.5 5 10 15 16

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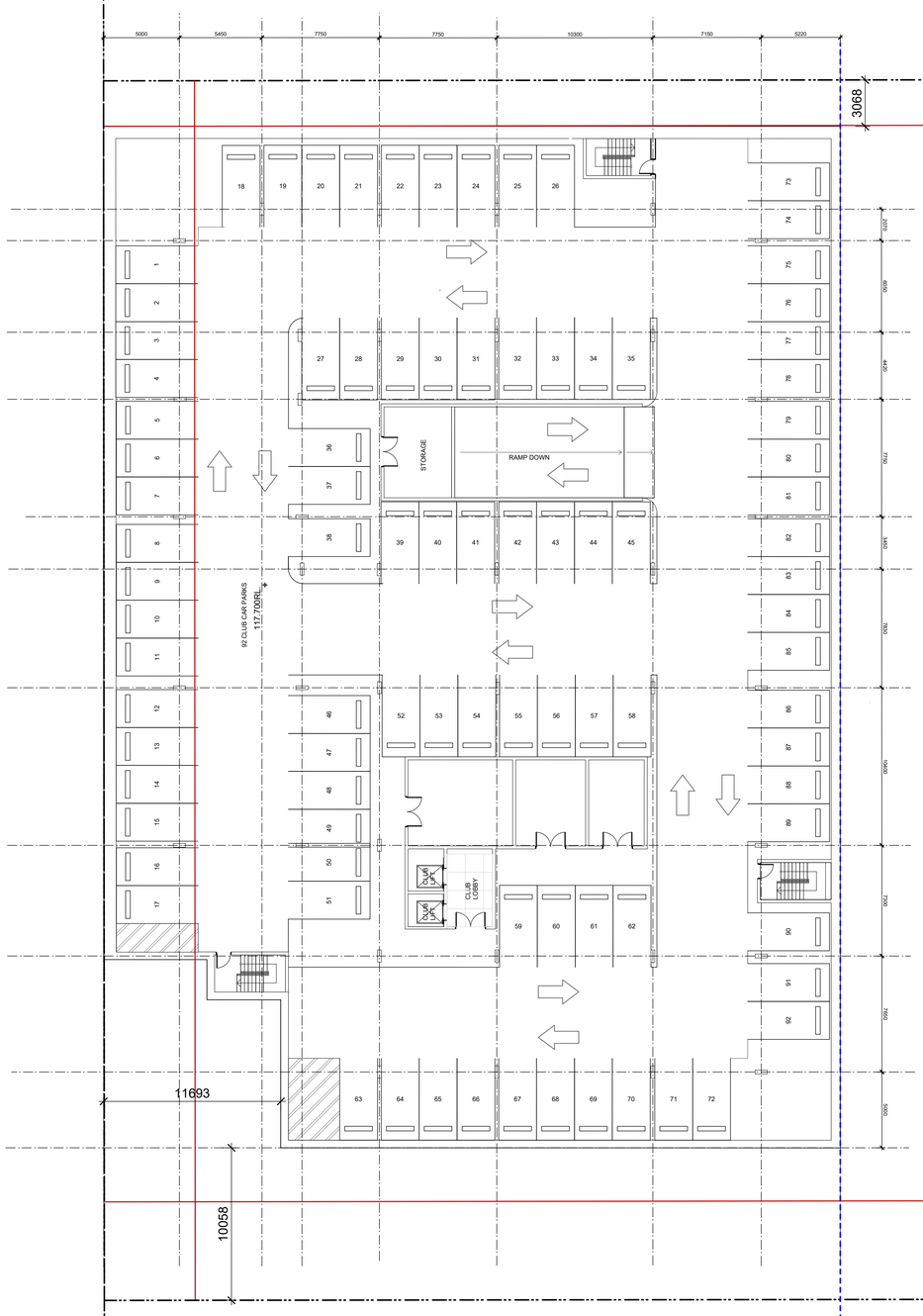
DRAWING
SITE PLAN - SETBACKS

MASTERPLAN SET

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Scale at A3 1:400
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01 SITE PLAN - BASEMENT 3
scale 1:200

N

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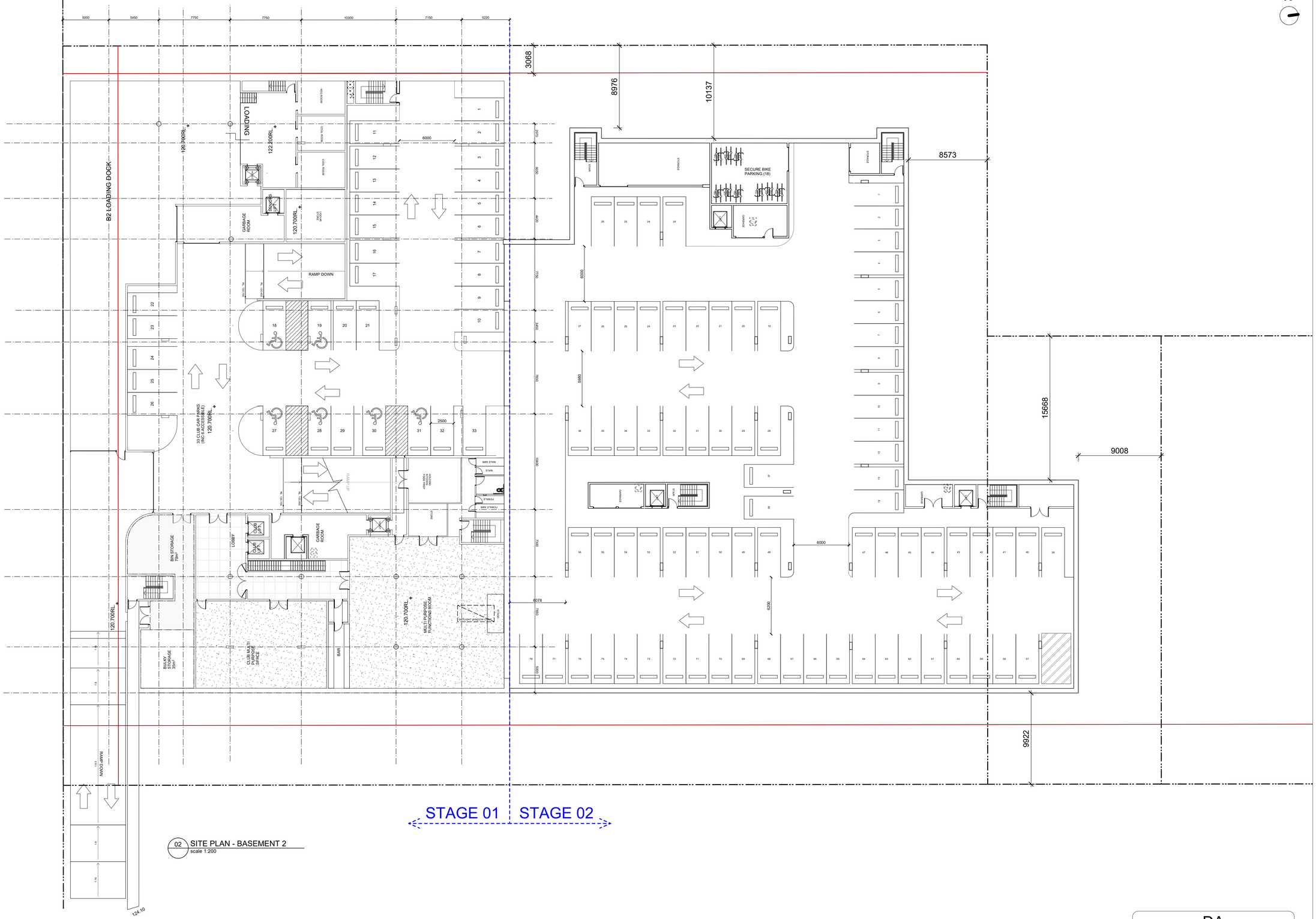
DRAWING
SITE PLAN - BASEMENT 3

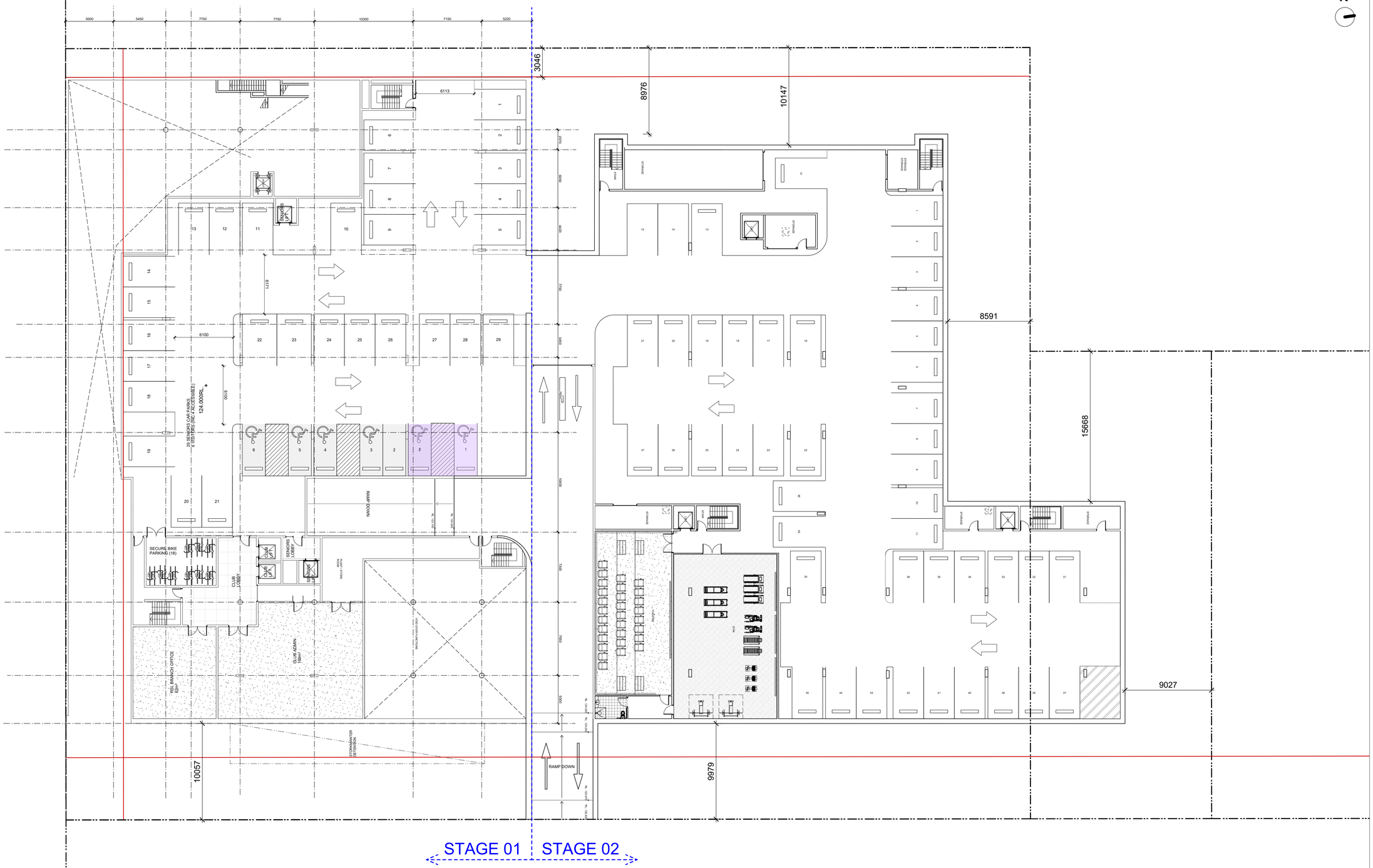
MASTERPLAN SET

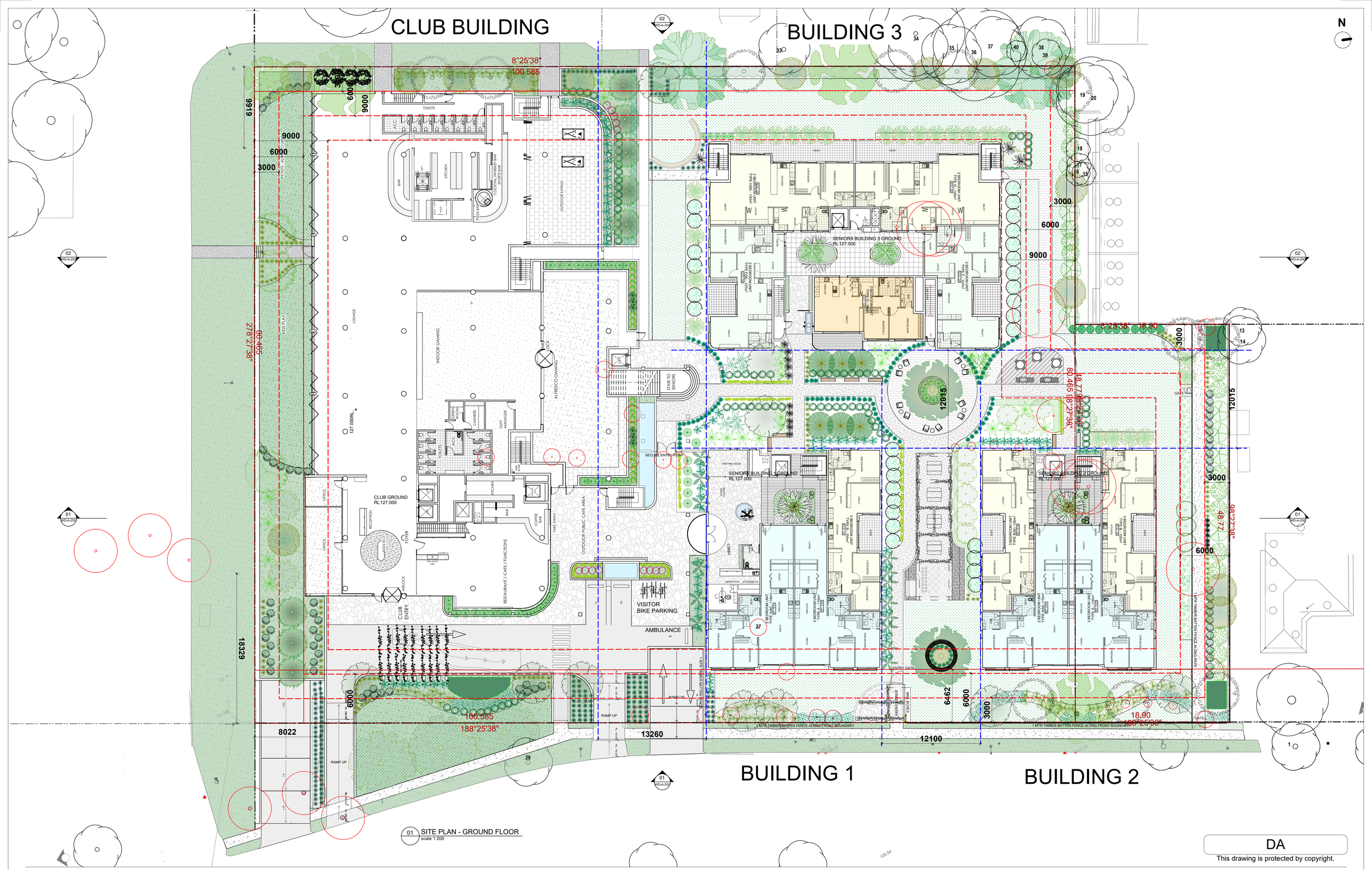
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Scale at A3 1:400
0m 2.5 5 10 15 16

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DRAWN	DATE	CHKD
AL	20/04/2023	PH
PROJECT #	SHEET #	REVISION #
22-0716	DA_A_97	G


N
5000
5450
7750
7750
10300
7150
5220
3068
8976
10137
8573
15668
9008
9922
B2 LOADING DOCK
LOADING
120.700RL
122.200RL
120.700RL
120.700RL
120.700RL
120.700RL
120.700RL
RAMP DOWN
RAMP DOWN
GARBAGE ROOM
GARBAGE ROOM
GARBAGE ROOM
BIN STORAGE 70m²
BULKY GOODS STORAGE 35m²
LOBBY
CLUB MULTI PURPOSE SPACE
BAR
MULTI PURPOSE FUNCTION ROOM
SECURE BIKE PARKING (18)
STORAGE
STAIR
LIFT
GARAGE
6000
6000
6000
6078
5980
6200
2500
3000
3000
3000


N
5000
5450
7750
7750
10300
7150
5220
3046
8976
10147
6113
8591
15668
9027
10057
9979
6171
6100
6100
6100
3070
4500
4450
7700
3400
1700
5900
7300
7360
5900
2000
2000
2000


CLUB BUILDING
BUILDING 3
BUILDING 1
BUILDING 2
N
8°25'38"
100.585
278°27'38"
80.465
188°25'38"
100.585
98°27'38"
48.77
188°25'38"
18.90
278°27'38"
80.465
98°27'38"
48.77
TOILETS
ACC.
BAR
KITCHEN
LIFT
PIZZA BAR
COCKTAIL / WHISKEY BAR
SPORTS BAR
OUTDOOR EATING
SPORTS WALL
OUTDOOR LOUNGE
INDOOR GAMING
LOUNGE
ALFRESCO GAMING
LIFT
STAIR TO SENIORS
SECURE ENTRY POINT
GREEN ROOM
CASHIERS
DUTY MANAGER
TOILETS
ACC.
OFFICE
OFFICE
CLUB GROUND
RL 127.000
RECEPTION
MAIN FOYER
AIRLOCK
CLUB ENTRY
KITCHEN
BAR
COFFEE BAR
TAKE AWAY
RESTAURANT / CAFE / FUNCTIONS
OUTDOOR PUBLIC CAFE AREA
VISITOR BIKE PARKING
AMBULANCE
RAMP UP
RAMP UP
RAMP UP
SENIORS BUILDING 3 GROUND
RL 127.000
SENIORS BUILDING 1 GROUND
RL 127.000
SENIORS BUILDING 2 GROUND
RL 127.000
MEETING ROOM
OFFICE
LOUNGE
CHEMIST
RECEPTION
KITCHENETTE
LIFT
LIFT
LIFT
LIFT
LIFT
LIFT
2 BEDROOM UNIT TYPE A1 - 116m²
2 BEDROOM UNIT TYPE A2 - 116m²
2 BEDROOM UNIT TYPE A3 - 116m²
2 BEDROOM UNIT TYPE A4 - 116m²
2 BEDROOM UNIT TYPE A5 - 116m²
3 BEDROOM UNIT TYPE A1 - 116m²
3 BEDROOM UNIT TYPE A2 - 116m²
3 BEDROOM UNIT TYPE A3 - 116m²
3 BEDROOM UNIT TYPE A4 - 116m²
3 BEDROOM UNIT TYPE A5 - 116m²
SENIORS BUILDING 3 GROUND
RL 127.000
ENTRY GATE
GATE
1 MTR TIMBER BATTEN FENCE ALONG FRONT BOUNDARY
1 MTR TIMBER BATTEN FENCE ALONG FRONT BOUNDARY
1 MTR TIMBER BATTEN FENCE ALONG PATH
9919
9000
6000
3000
18329
8022
13260
12100
6462
12015
12015
18329
6000
3000
9000
6000
3000
6000
3000
6000
3

N

02 WD-A-200

CLUB BUILDING

BUILDING 3

BUILDING 1

BUILDING 2

8°25'38"
100.585

3000
6000
9000
9916

80.465
278°27'38"

13500

11724

3000
6000
9000

8°25'38"
18.90

3000
15179
12015

8053
9709

18329

18288

6000

100.585
188°25'38"

8022

13260

12100

6462
6000
3000

18.90
188°25'38"

3000
48.77
98°27'38"
6000
9000

CLUB RESI - LEVEL 1
RL131.500

SENIORS BUILDING 3 LEVEL 1
RL 130.100

SENIORS BUILDING 1 LEVEL 1
RL 130.100

SENIORS BUILDING 2 LEVEL 1
RL 130.100

01 SITE PLAN - LEVEL 1
scale 1:200

01 WD-A-200

02 WD-A-200

01 WD-A-200

02 WD-A-200

DA

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ACN 150 198 842 **W:** www.qarch.com.au

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A	16/11/2022	CLIENT MEETING	PJH
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PROJECT
CLUB REDEVELOPMENT
22 MELWOOD AVE
LOT 2589 & LOT 31
DP752038 & DP 366454

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DRAWING
SITE PLAN - LEVEL 1

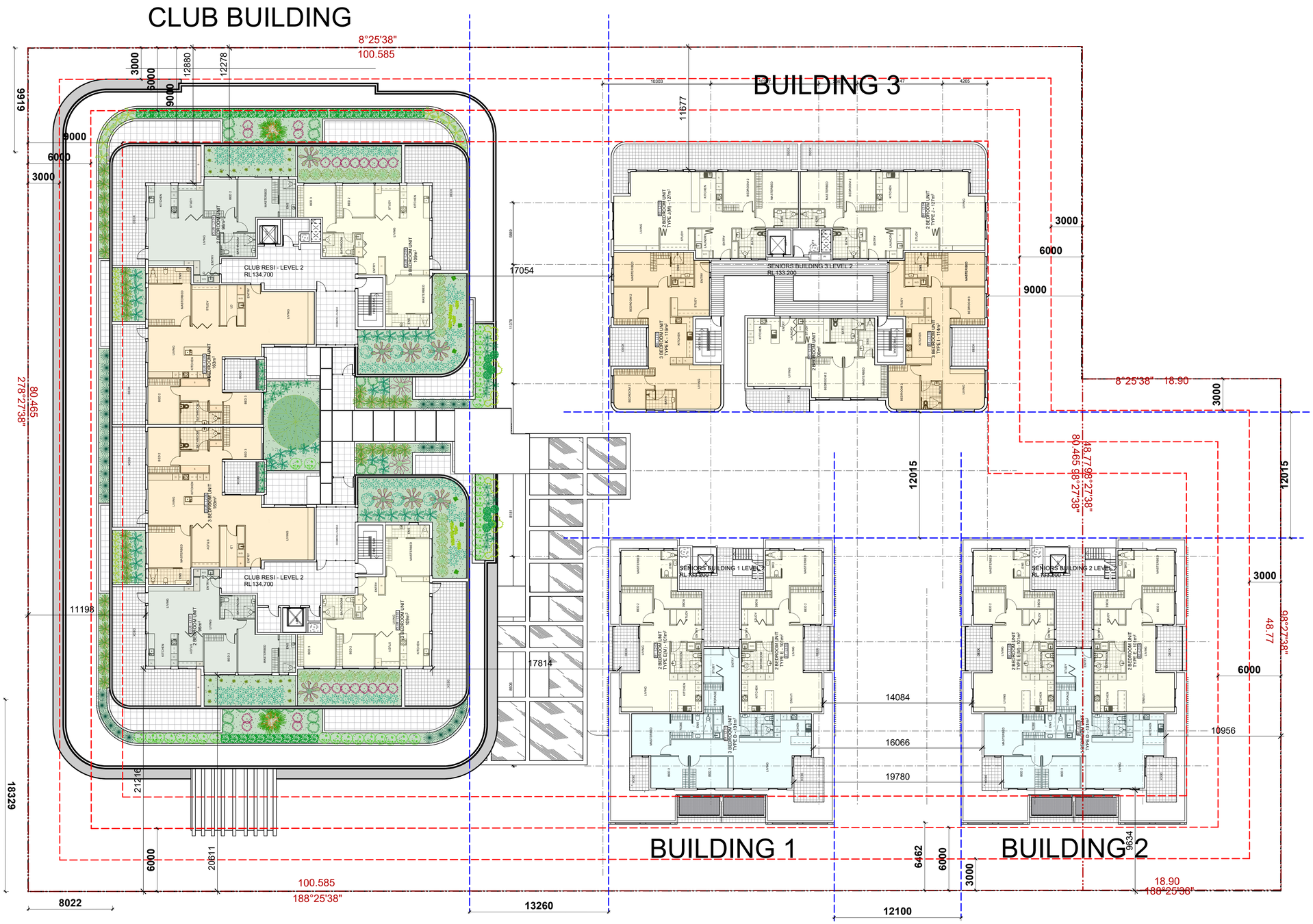
Scale at A1 1:200
Scale at A3 1:400
0m 2.5 5 10 15 16

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AL	20/04/2023	PH
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01 SITE PLAN - LEVEL 2
scale 1:200

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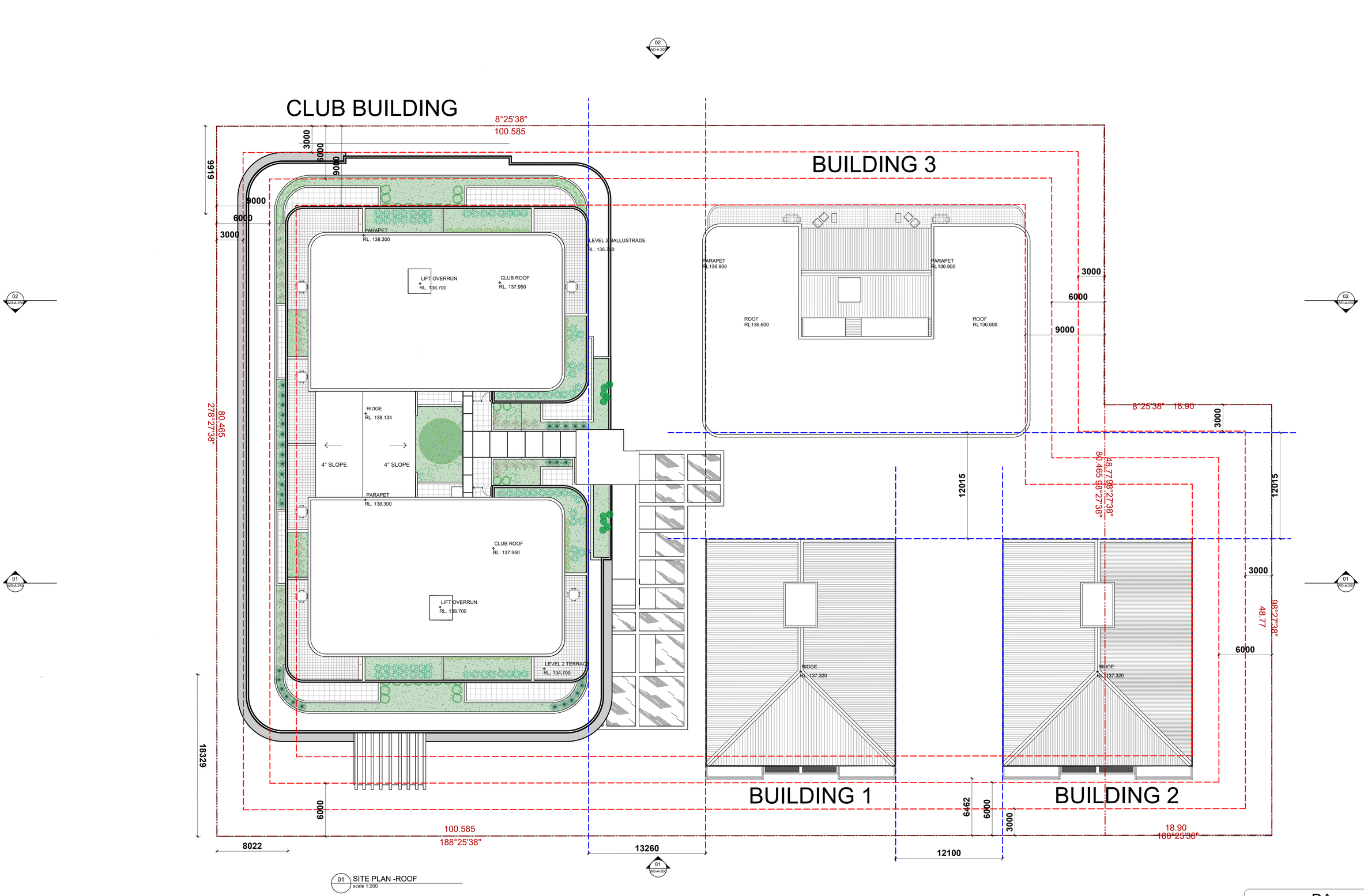
DRAWING
SITE PLAN - LEVEL 2

Scale at A1 1:200
Scale at A3 1:400
0m 2.5 5 10 15 16

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01 SITE PLAN -ROOF
scale 1:200

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CLUB REDEVELOPMENT
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LOT 2589 & LOT 31
DP752038 & DP 366454

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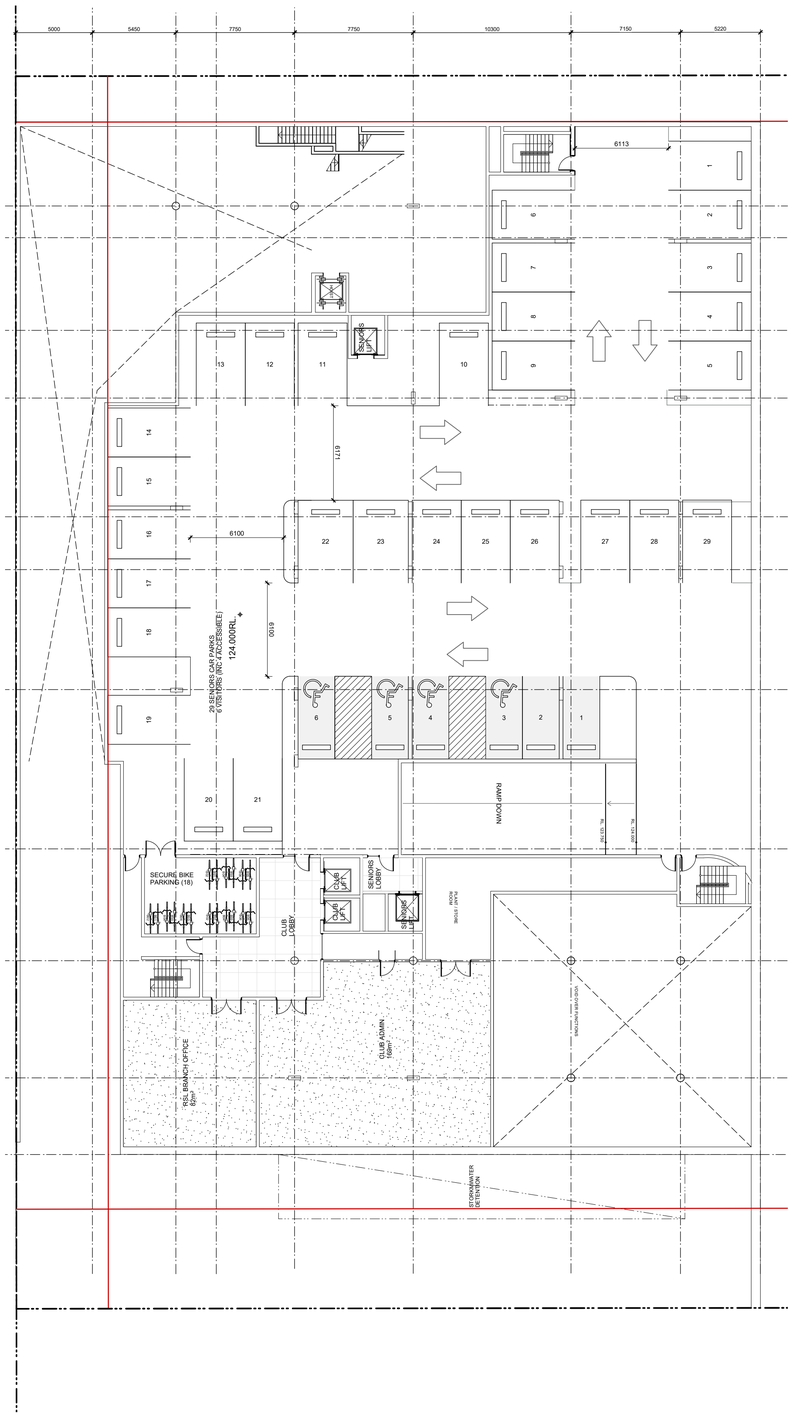
DRAWING
SITE PLAN - ROOF

Scale at A1 1:200
Scale at A3 1:400
0m 2.5 5 10 15 16

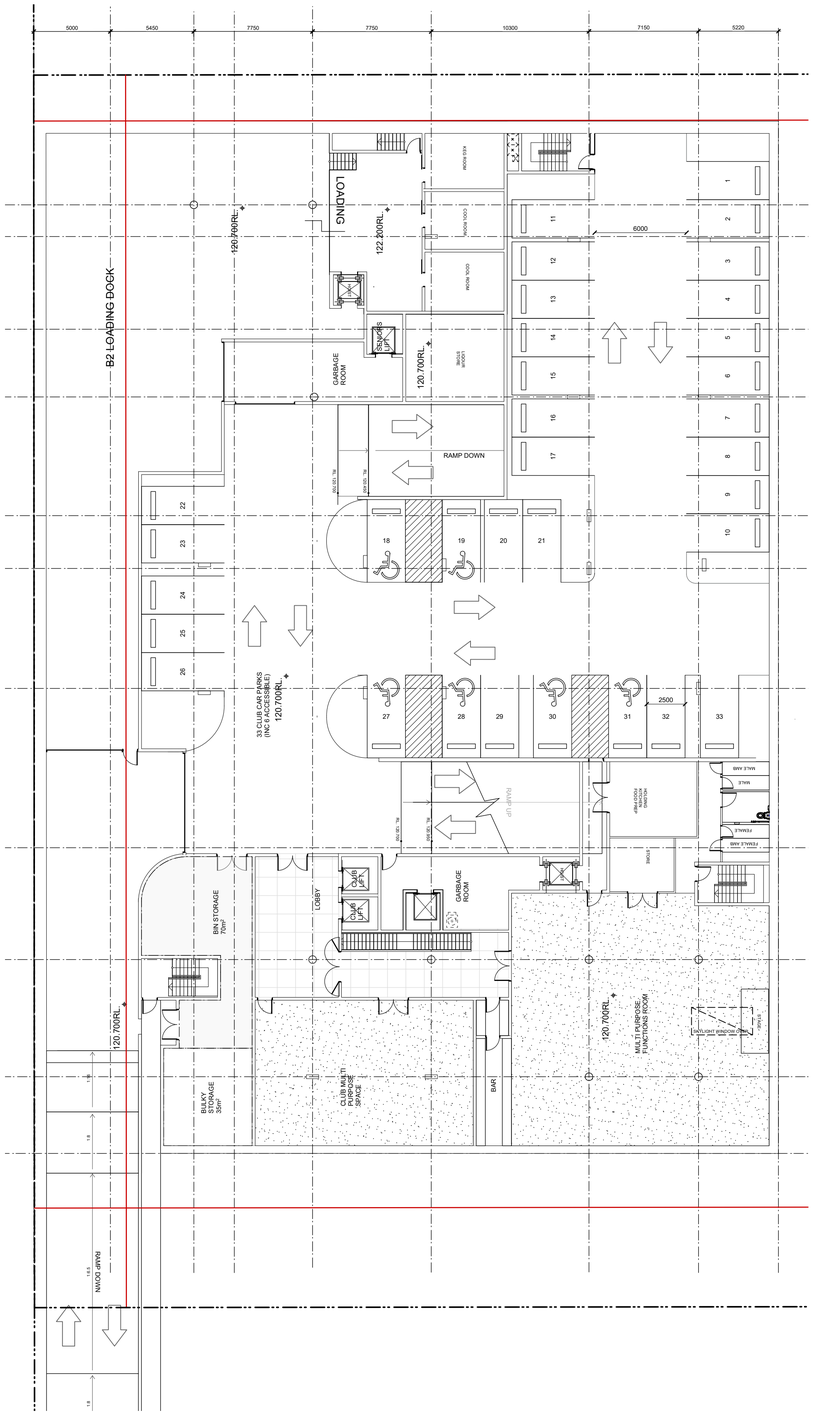
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MASTERPLAN SET

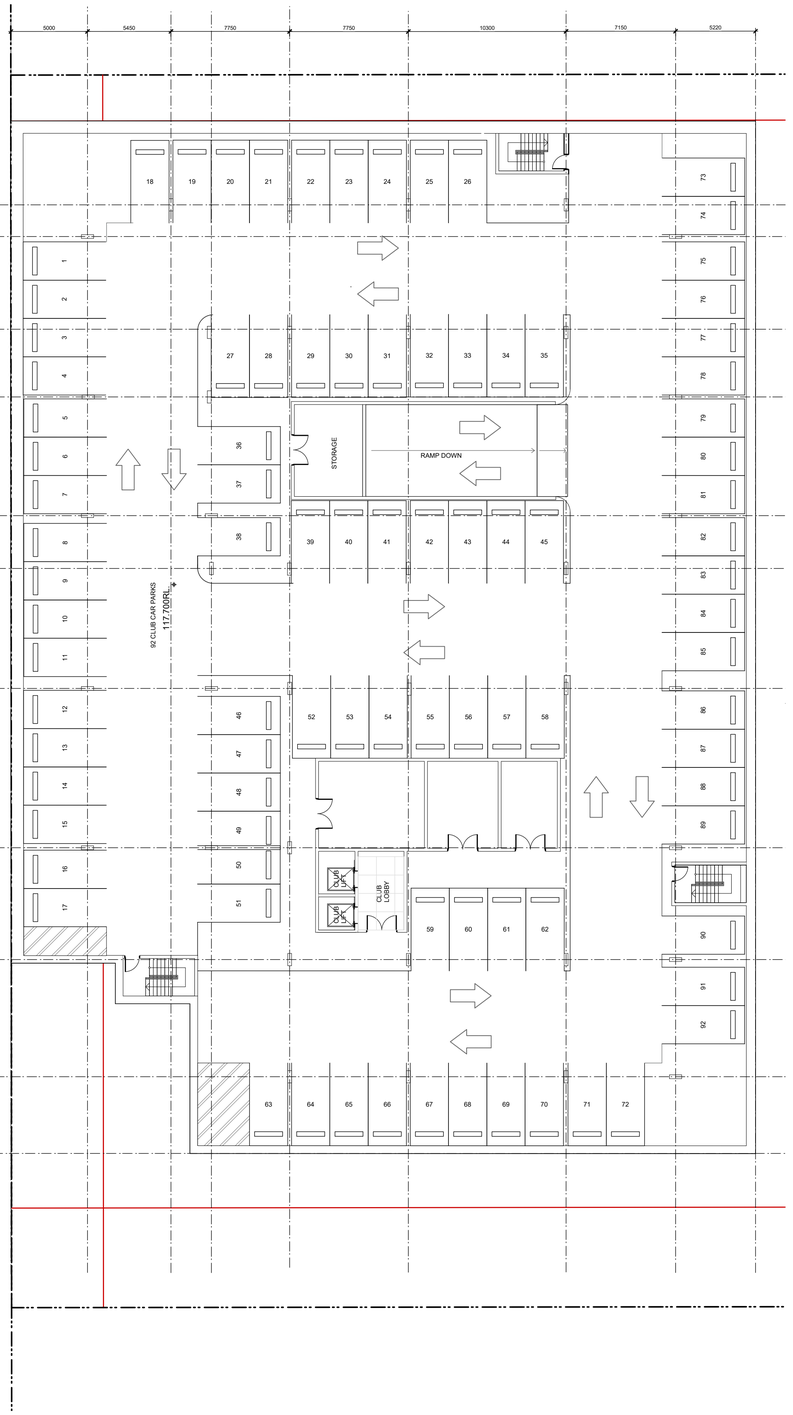
DRAWN	DATE	CHKD
AL	20/04/2023	PH
PROJECT #	SHEET #	REVISION #
22-0716	DA_A_103	G



01 STAGE 1 - BASEMENT 1 - SENIORS PARKING
scale 1:200



02 STAGE 1 - BASEMENT 2 - CLUB PARKING
scale 1:200



02 STAGE 1 - BASEMENT 3 - CLUB PARKING
scale 1:200

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CLUB REDEVELOPMENT
22 MELWOOD AVE
LOT 2589 & LOT 31
DP752038 & DP 366454

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DRAWING
STAGE 1 CAR PARKING

Scale at A1 1:200
Scale at A3 1:400
0m 2.5 5 10 15 16

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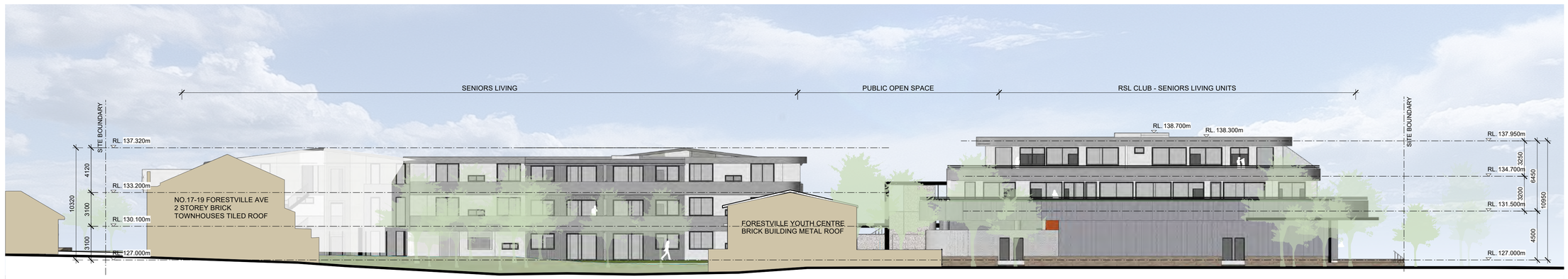
MASTERPLAN SET

DRAWN	DATE	CHKD
AL	20/04/2023	PH
PROJECT #	SHEET #	REVISION #
22-0716	**DA_A_104**	**G**

N



01 EASTERN BUILDING ELEVATION - MELWOOD AVENUE
scale 1:200



03 WESTERN BUILDING ELEVATION - BACK
scale 1:200

05 PRE-DA CHECKLIST
scale 1:-

Documentation	Required information	Provided	
		Yes (✓)	No (x)
Streetscape elevations and sections	Photographs or drawings of the site in relation to the streetscape and along both sides of any street that the development fronts, that show:		
	• overall height (storeys, metres) and important parapet/datum lines of adjacent buildings	✓	
	• patterns of building frontage, street setbacks and side setbacks	✓	
	• planned heights	✓	

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PROJECT
CLUB REDEVELOPMENT
22 MELWOOD AVE
LOT 2589 & LOT 31
DP752038 & DP 366454

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DRAWING
ELEVATIONS

Scale at A1 1:200
Scale at A3 1:400
0m 2.5 5 10 15 16

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MASTERPLAN SET

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PROJECT #	SHEET #	REVISION #
22-0716	**DA_A_200**	**G**

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22 MELWOOD AVE
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DRAWING
3D MONTAGE

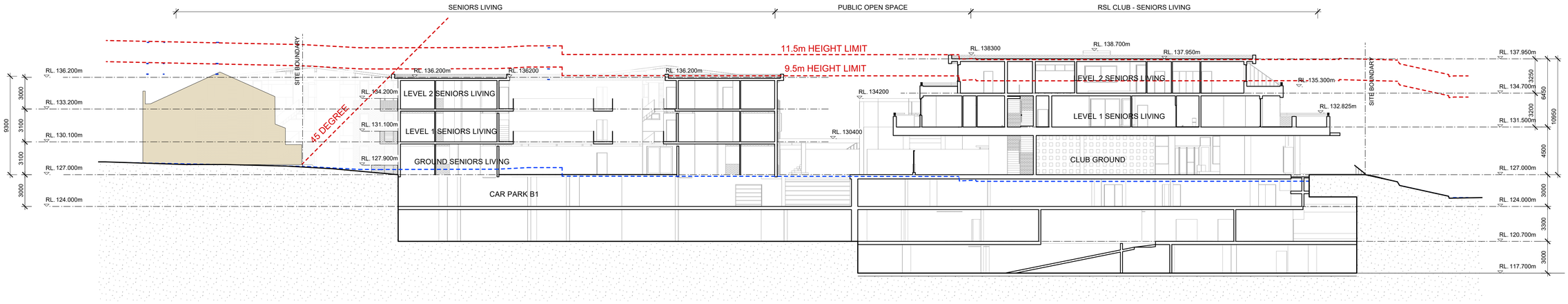
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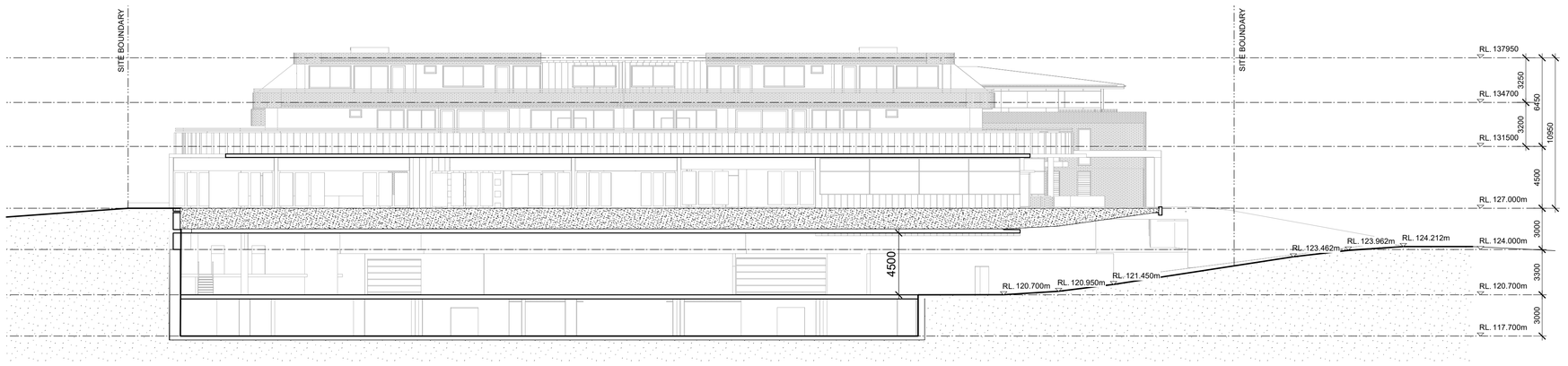
MASTERPLAN SET

DRAWN	DATE	CHKD
AL	20/04/2023	PH
PROJECT #	SHEET #	REVISION #
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N



01 SITE SECTION
scale 1:200



02 SITE SECTION
scale 1:200

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PROJECT
CLUB REDEVELOPMENT
22 MELWOOD AVE
LOT 2589 & LOT 31
DP752038 & DP 366454

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DRAWING
SECTIONS

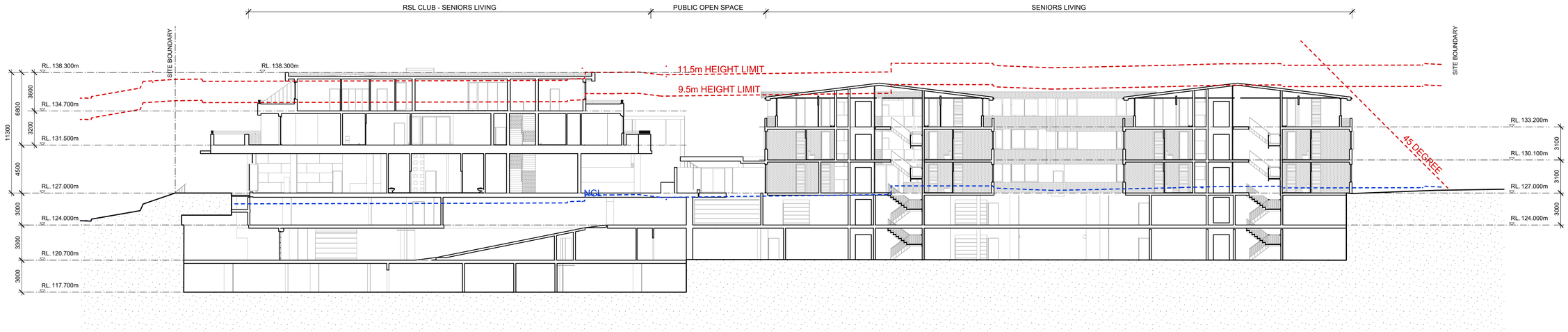
Scale at A1 1:200
Scale at A3 1:400
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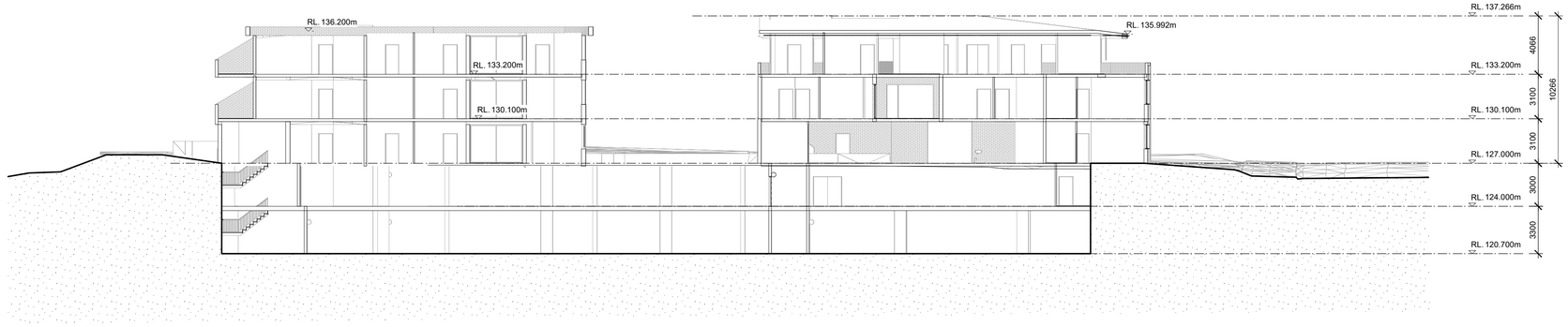
MASTERPLAN SET

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AL	20/04/2023	PH
PROJECT #	SHEET #	REVISION #
22-0716	DA_A_250	G

N



01 SITE SECTION
scale 1:200



02 SITE SECTION
scale 1:200

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DRAWING
SECTIONS

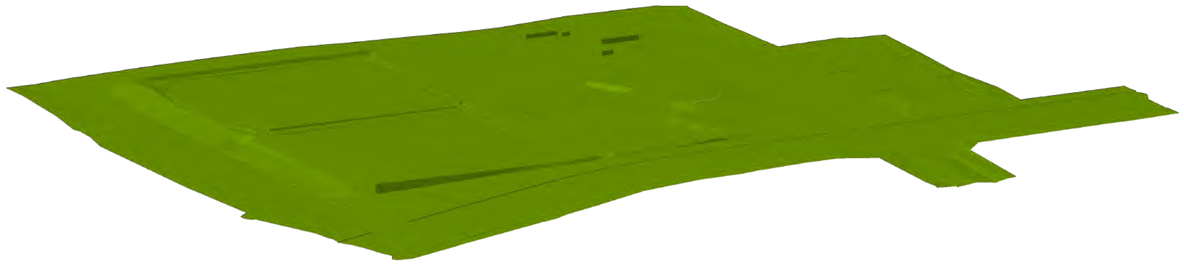
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Scale at A3 1:400
0m 2.5 5 10 15 16

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MASTERPLAN SET

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22-0716	**DA_A_251**	**G**

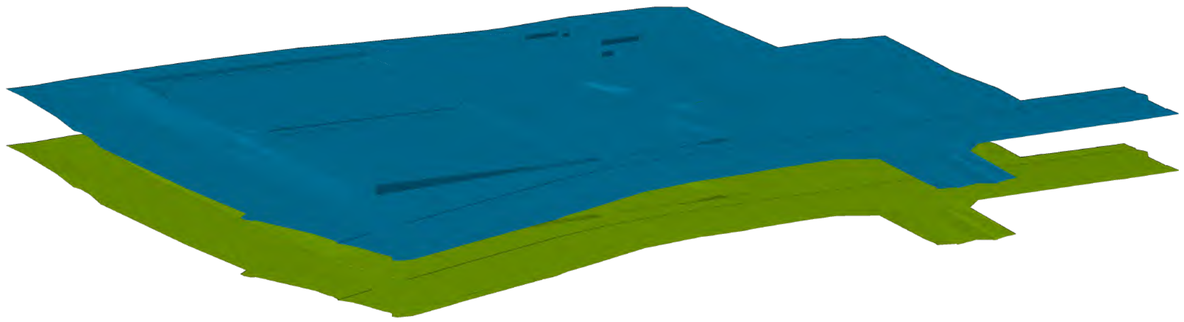
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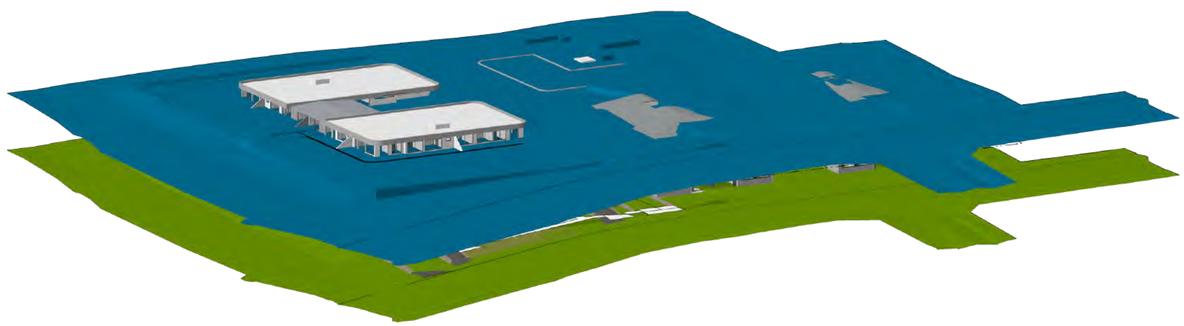
3D SITE SURVEY -REFERENCE LTS SURVEY: 52165002DT (GREEN)



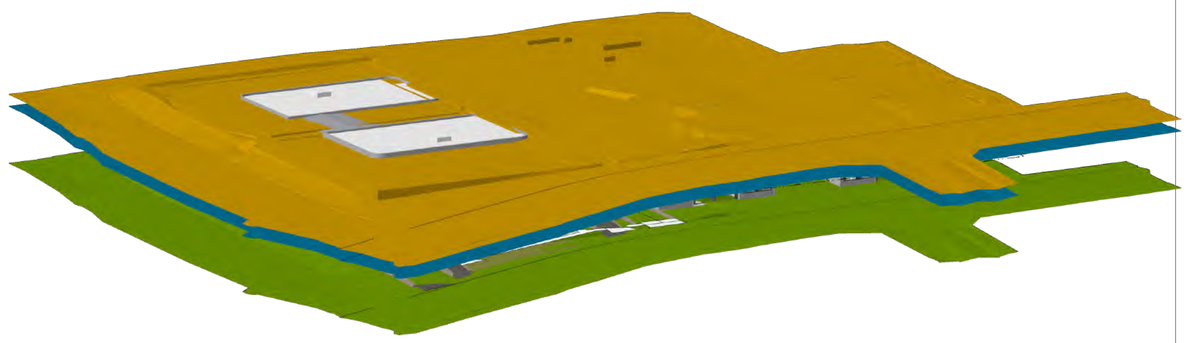
PROJECT OVERLAY - 3D SITE SURVEY -REFERENCE LTS SURVEY: 52165002DT



SENIORS HEIGHT LIMIT (9.5) - 3D SITE SURVEY -REFERENCE LTS SURVEY: 52165002DT



PROJECT OVERLAY WITH 9.5MTR HEIGHT PLANE



PROJECT OVERLAY WITH 11.5MTR HEIGHT PLANE

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FORESTVILLE RSL

PROJECT
CLUB REDEVELOPMENT
22 MELWOOD AVE
LOT 2589 & LOT 31
DP752038 & DP 366454

FROM OUR FAMILY TO YOURS · SINCE 1959 ·

DRAWING
HEIGHT ENVELOPE STUDY

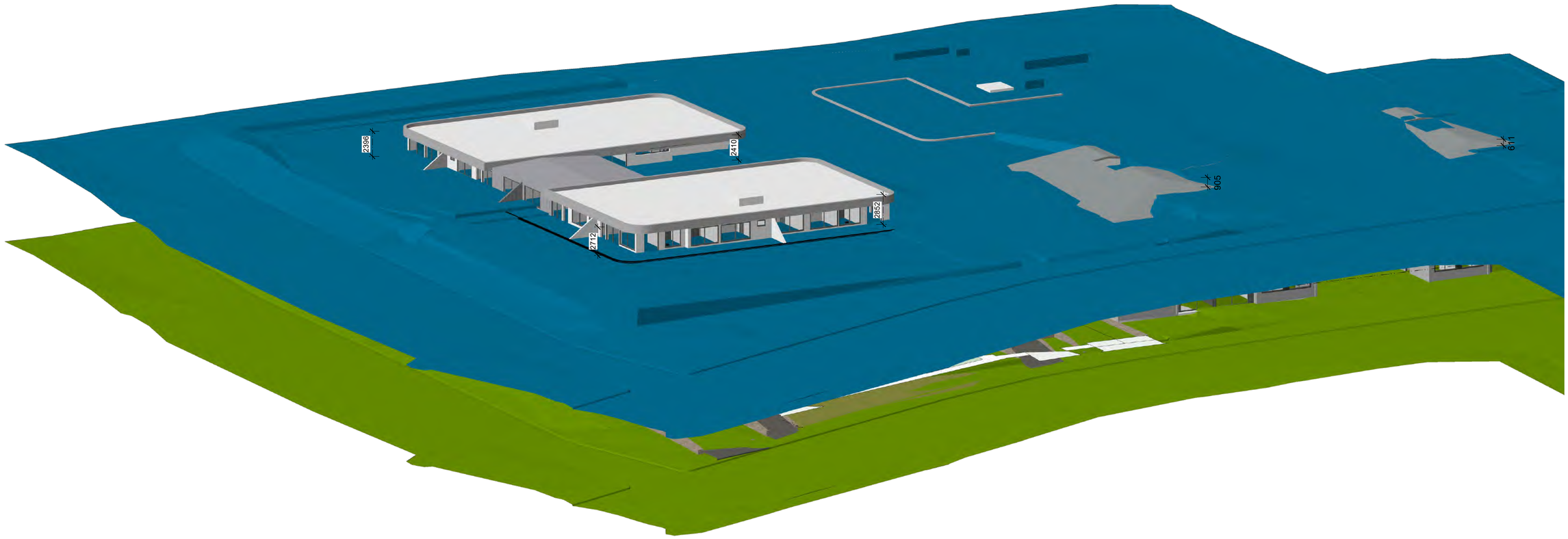
Scale at A1 1:200
Scale at A3 1:400
0m 2.5 5 10 15 16

Figured dimensions shall take precedence over scale. Contractors must verify all dimensions on job before commencing any work or making shop drawings.

MASTERPLAN SET

DRAWN	DATE	CHKD
AL	20/04/2023	PH
PROJECT #	SHEET #	REVISION #
22-0716	**DA_A_300**	**G**

N



PROJECT OVERLAY WITH 9.5MTR HEIGHT PLANE

01 9.5 mtr HEIGHT LIMIT
scale 1:200

DA

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Quattro ARCHITECTURE

Sydney F: 61 2 9091 0190
Suite 129, 117 Old Pittwater Road
Brookvale NSW 2100
Peter Hosking (Director) Registered Architect - 6854

Canberra F: 61 2 6239 4044
Unit 5, 71 Leichhardt Street
Kingston ACT 2604
Tim Zuber Registered Architect - 2384

ACN 150 198 842 **W:** www.qarch.com.au

Rev. No.	Date	Revision	By
A	16/11/2022	CLIENT MEETING	PJH
B	01/12/2023	CONCEPT UPDATE	PJH
C	12/04/2024	B5 ADDED	PJH
D	30/08/2024	DA	PH
E	14/02/2025	DA UPDATE	PH
F	11/04/2025	ISSUE TO CONSULTANTS	PJH
G	5/05/2025	DA RESUBMISSION	pjh

CLIENT
FORESTVILLE RSL

PROJECT
CLUB REDEVELOPMENT
22 MELWOOD AVE
LOT 2589 & LOT 31
DP752038 & DP 366454

FROM OUR FAMILY TO YOURS · SINCE 1959 ·

DRAWING
HEIGHT ENVELOPE STUDY 9.5m

MASTERPLAN SET

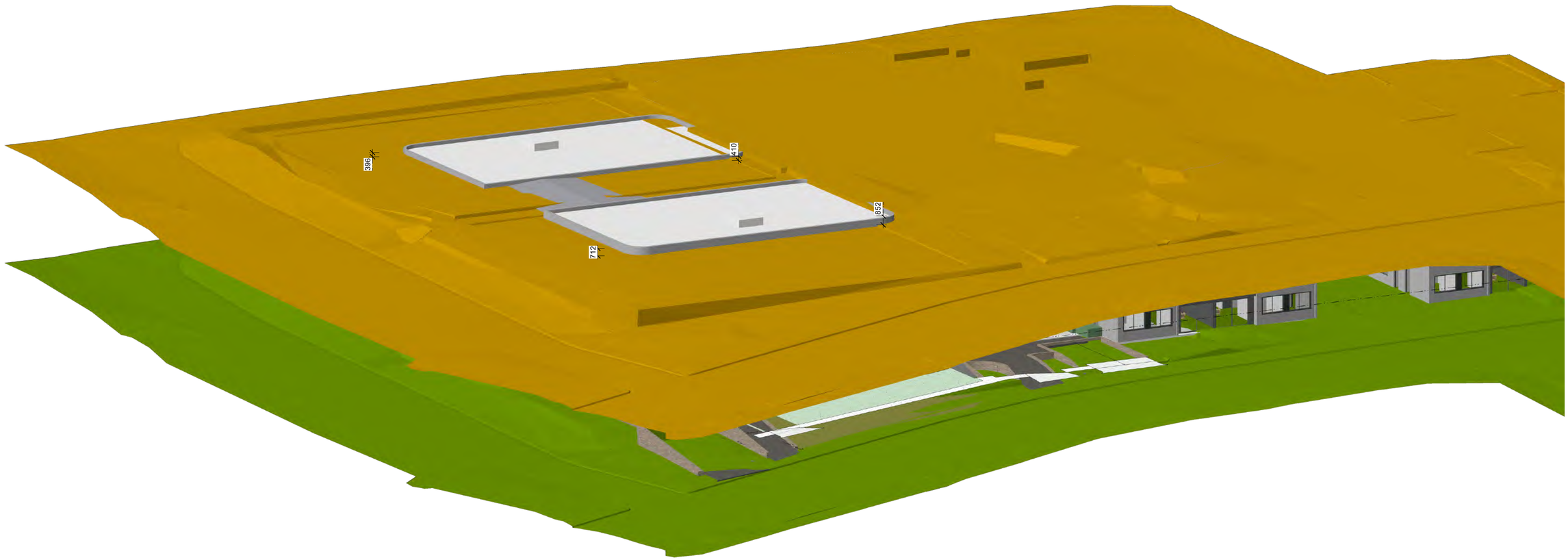
Scale at A1 1:200
Scale at A3 1:400
0m 2.5 5 10 15 16

Figured dimensions shall take precedence over scale. Contractors must verify all dimensions on job before commencing any work or making shop drawings.

DRAWN	DATE	CHKD
AL	20/04/2023	PH

PROJECT #	SHEET #	REVISION #
22-0716	**DA_A_301**	**G**

N



PROJECT OVERLAY WITH 11.5MTR HEIGHT PLANE

01 11.5 mtr HEIGHT LIMIT
scale 1:200

DA

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Quattro ARCHITECTURE

ACN 150 198 842 **W:** www.qarch.com.au

Sydney F: 61 2 9091 0190
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Brookvale NSW 2100
Peter Hosking (Director) Registered Architect - 6854

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E	14/02/2025	DA UPDATE	PH
F	11/04/2025	ISSUE TO CONSULTANTS	PJH
G	5/05/2025	DA RESUBMISSION	pjh

CLIENT
FORESTVILLE RSL

PROJECT
CLUB REDEVELOPMENT
22 MELWOOD AVE
LOT 2589 & LOT 31
DP752038 & DP 366454

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DRAWING
HEIGHT ENVELOPE STUDY 11.5m

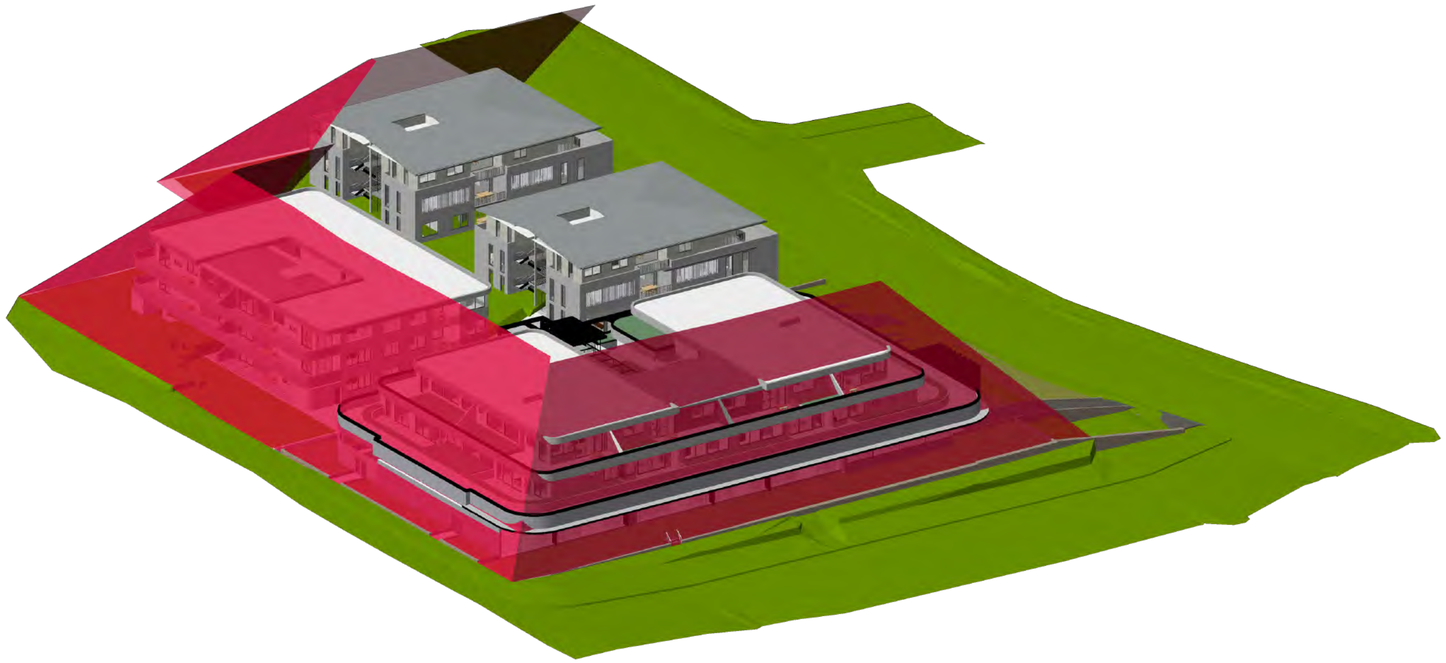
Scale at A1 1:200
Scale at A3 1:400
0m 2.5 5 10 15 16

Figured dimensions shall take precedence over scale. Contractors must verify all dimensions on job before commencing any work or making shop drawings.

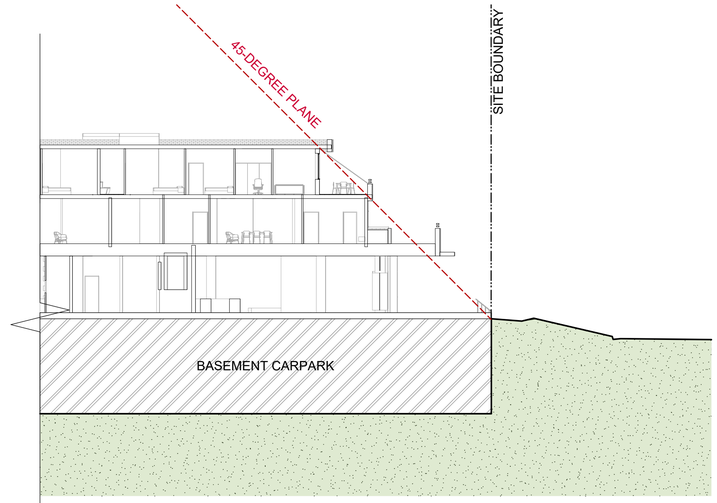
MASTERPLAN SET

DRAWN	DATE	CHKD
AL	20/04/2023	PH
PROJECT #	SHEET #	REVISION #
22-0716	**DA_A_302**	**G**

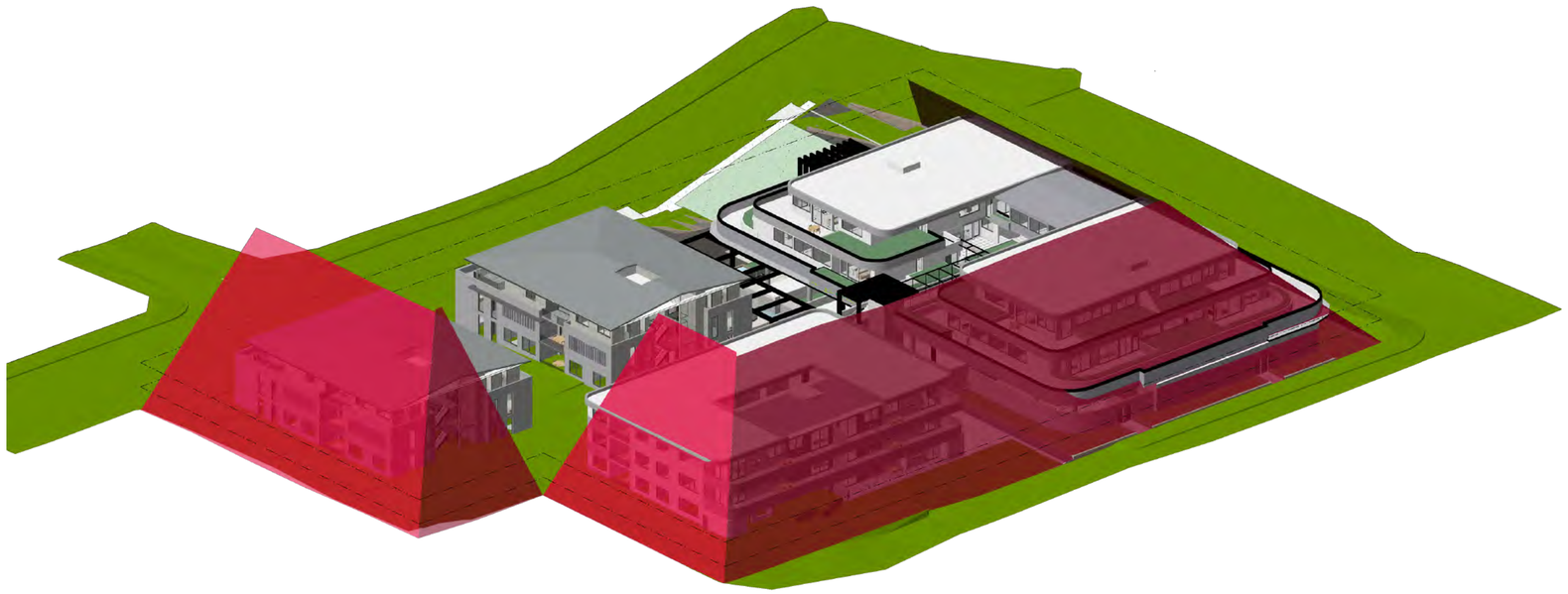
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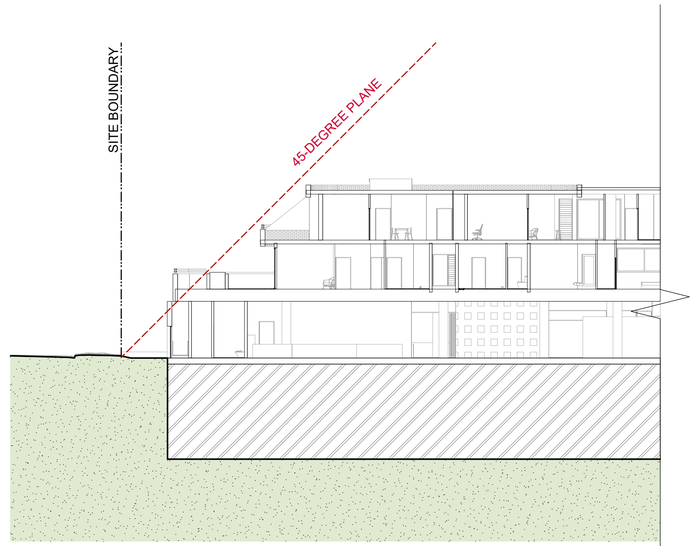
01 45 DEGREE STUDY
scale 1:350



03 45 DEGREE SECTION
scale 1:200



02 45 DEGREE STUDY
scale 1:350



04 45 DEGREE SECTION
scale 1:200

DA

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Quattro ARCHITECTURE

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Suite 129, 117 Old Pittwater Road
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Rev. No.	Date	Revision	By
A	16/11/2022	CLIENT MEETING	PJH
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C	12/04/2024	B5 ADDED	PJH
D	30/08/2024	DA	PH
E	14/02/2025	DA UPDATE	PH
F	11/04/2025	ISSUE TO CONSULTANTS	PJH
G	5/05/2025	DA RESUBMISSION	pjh

CLIENT
FORESTVILLE RSL

PROJECT
CLUB REDEVELOPMENT
22 MELWOOD AVE
LOT 2589 & LOT 31
DP752038 & DP 366454

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DRAWING
3D 45-DEGREE PLANE STUDY

Scale at A1 1:200
Scale at A3 1:400
0m 2.5 5 10 15 16

Figured dimensions shall take precedence over scale. Contractors must verify all dimensions on job before commencing any work or making shop drawings.

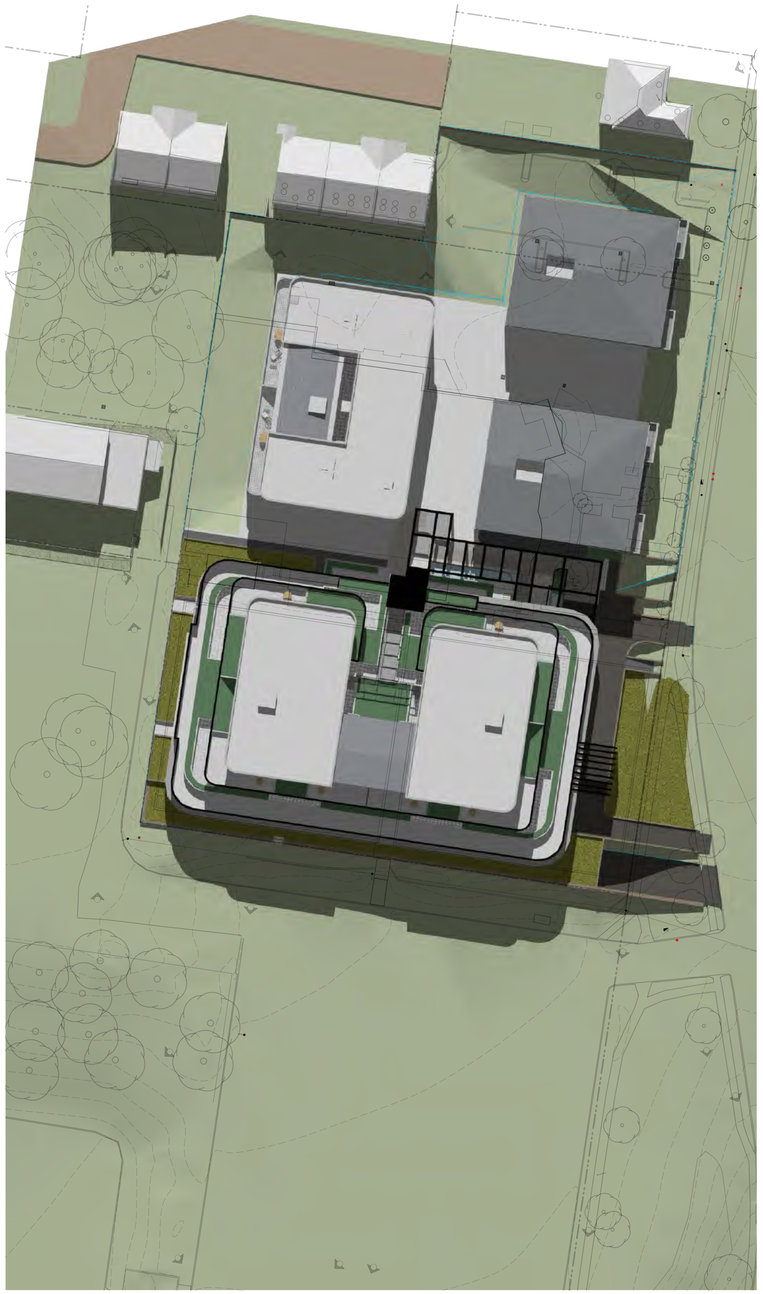
MASTERPLAN SET

DRAWN	DATE	CHKD
AL	20/04/2023	PH
PROJECT #	SHEET #	REVISION #
22-0716	DA_A_303	G

N



01 SHADOWS - JUNE 21 - 9AM
scale 1:500



02 SHADOWS - JUNE 21 - 12PM
scale 1:500



03 SHADOWS - JUNE 21 - 3PM
scale 1:500

DA

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Quattro ARCHITECTURE

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PROJECT
CLUB REDEVELOPMENT
22 MELWOOD AVE
LOT 2589 & LOT 31
DP752038 & DP 366454

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DRAWING
SHADOW DIAGRAMS

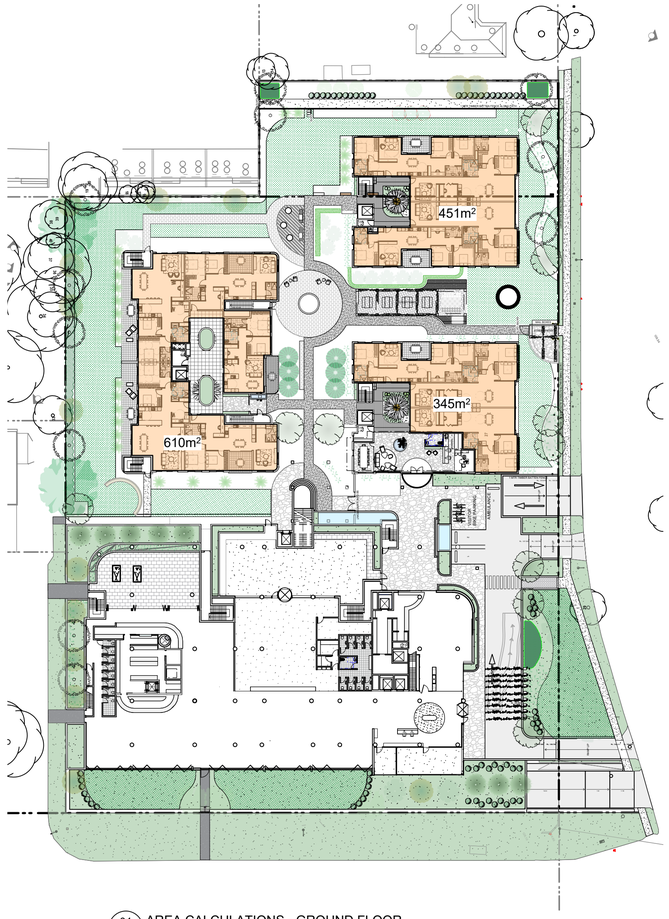
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Scale at A3 1:1000
0m 5 10 25 40

Figured dimensions shall take precedence over scale. Contractors must verify all dimensions on job before commencing any work or making shop drawings.

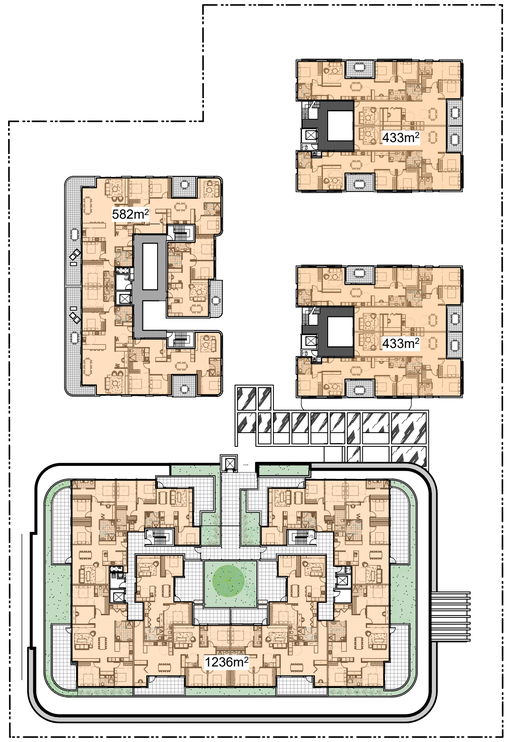
MASTERPLAN SET

DRAWN	DATE	CHKD
AL	20/04/2023	PH
PROJECT #	SHEET #	REVISION #
22-0716	**DA_A_400**	**G**

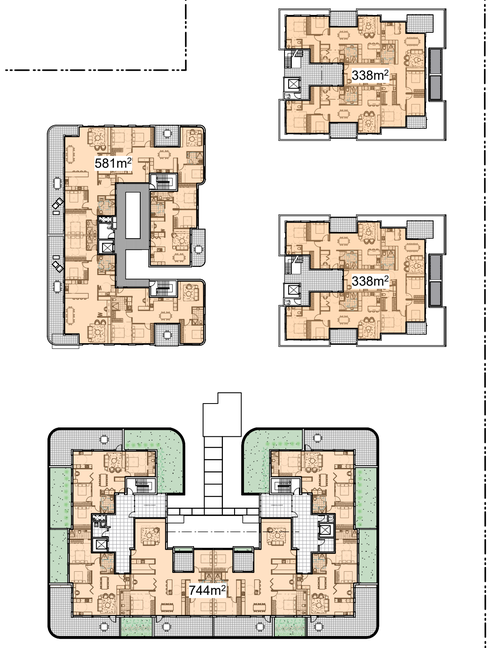
N



04 AREA CALCULATIONS - GROUND FLOOR
scale 1:500



05 AREA CALCULATIONS - LEVEL 1
scale 1:500



06 AREA CALCULATIONS - LEVEL 2
scale 1:500

Retirement Living - Club Building	
1	1236
2	744
	1980
Retirement Living - Building 1	
G	345
1	433
2	338
	1116
Retirement Living - Building 2	
G	451
1	433
2	338
	1222
Retirement Living - Building 3	
G	610
1	582
2	581
	1773
SENIOR TOTAL NSA	6091

DA

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Rev. No.	Date	Revision	By
F	11/04/2025	ISSUE TO CONSULTANTS	PJH
G	5/05/2025	DA RESUBMISSION	pjh

CLIENT
FORESTVILLE RSL

PROJECT
CLUB REDEVELOPMENT
22 MELWOOD AVE
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DRAWING
AREA CALCS - NET SALEALBE AREA

Scale at A1 1:500
Scale at A3 1:1000
0m 5 10 25 40

Figured dimensions shall take precedence over scale. Contractors must verify all dimensions on job before commencing any work or making shop drawings.

MASTERPLAN SET

DRAWN	DATE	CHKD
AL	20/04/2023	PH
PROJECT #	SHEET #	REVISION #
22-0716	**DA_A_800**	

APPENDIX B

FORMER JK GEOTECHNICAL BOREHOLE LOGS

Borehole Log Report

Geo Environmental Engineering
2 / 5-7 Malta Street
Fairfield East NSW 2165
T +61 2 9420 3361

Hole ID. **BH101**
Hole Depth: **10.23 m**
Sheet: **1 of**

Project Name: **PSI / Geotechnical Investigation**
Project Number: **E24016FOR**
Location / Site: **20 - 22 Melwood Avenue, Forestville NSW**
Client: **Forestville RSL Club Ltd**

Drilling Company: **Geo Environmental Engineering**
Date Started: **25/07/2024**
Ground Level: **RL127.6m** (approx)
Drill Method: **SFA / NMLC**
Date Completed: **25/07/2024**
Easting: ----------
Equipment: **Hanjin D&B 8D**
Northing: ----------

Method	Depth (m)	RL (m)	USCS Symbol	Material Type	Material Description	Consistency / Density	Moisture	Samples / Tests: ID No.	Samples / Tests: SPT	Observations / Comments	Well Details	Well Construction
SFA	0	127.5	SC	Fill	**ASPHALT (80mm).**						0.00 0.05 0.15	
					FILL / DISTURBED- Clayey Sand, orange/red/brown, with Silt.	medium dense to dense	m	ZZ250724-01 0.2 -0.3m				
	1	127.0	SP	Residual Soil	**SAND (extremely weathered sandstone)**- red/orange/grey, fine to medium grained, trace clay, with bands of highly weathered sandstone.			BH101-0.5 0.5 -0.6m	5 30 Ref. blows 30+		1.00 Bentonite	
		126.5										
		126.0										
	2	125.5			*BH101 continued as cored hole from 1.72m*							
		125.0										
	3	124.5										
		124.0										
	4	123.5										
		123.0										
	5	122.5										
		122.0										
	6											

Moisture

D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

Logged By: **Zachary Ziesel** Date: **25/07/2024**
Checked By: **Stephen McCormack** Date: **19/08/2024**

drawn by: laurie.white@reumad.com.au
GEE BH LOG 2 E24016FOR.GPJ GEE.GDT 20/8/24 7:19:09 PM

Borehole Log Report

Geo Environmental Engineering
82 Bridge Street
Lane Cove NSW 2066
T +61 2 9420 3361

Hole ID. **BH101**
Hole Depth: **10.23 m**
Sheet: **3 of 4**

Project Name: **PSI / Geotechnical Investigation**
Project Number: **E24016FOR**
Location / Site: **22 Melwood Avenue, Forestville NSW**
Client: **Forestville RSL**

Drilling Company: **Geo Environmental Engineering**
Date Started: **25/07/2024**
Ground Level: **RL127.6m** approx
Drill Method: **SFA / NMLC**
Date Completed: **25/07/2024**
Easting: ----------
Equipment: **Hanjin D&B 8D**
Northing: ----------

Method	Depth (m)	RL (m)	Material Description	Weathering	Estimated Strength (MPa)	$Is_{(50)}$ MPa	U.C.S. (Mpa)	Rock Mass Defects: RQD %	Core Photo	Defect Spacing (mm)	Defect Description (type, inclination, thickness, shape, roughness, coating)	Well Details	Depth (m)	Casing & Core Lifts
NMLC	0.0	127.5											0.0	
	0.5	127.0											0.5	
	1.0	126.5											1.0	
	1.5	126.0											1.5	
	2.0	125.5	**SANDSTONE** - red/orange/grey, fine to coarse grained.	HW-MW		A=0.29 D=0.2		92			DB; SM, CLAY; SM, CLAY		2.0	
	2.5	125.0									SM, CLAY		2.5	2.7
	3.0	124.5				A=0.12 D=0.05					DB; JT, 35, RG, FE; BD, 1, RG, FE		3.0	
	3.5	124.0									SM, CLAY; BD, 3, RG, FE; SM, CLAY; SM, CLAY		3.5	
	4.0	123.5		FR		A=0.34 D=0.21		90			BD, 4, RG, FE; BD, 2, RG, FE; SM, CLAY; HB		4.0	
	4.5	123.0									DB		4.5	
	5.0	122.5	**SHALE** - dark grey.			A=0.1 D=0.03					BD, 1, SMTH		5.0	
	5.5	122.0	**SANDSTONE** - grey, fine to coarse grained.								BD/SM (2-5mm spacing, clay infill); BD, 2, RG; SM, CLAY		5.5	5.83
	6.0							100					6.0	

Bedrock

Additional Comments

Logged By: **Zachary Ziesel** Date: **25/07/2024**
Checked By: **Stephen McCormack** Date: **19/08/2024**

drawn by: laurie.white@reumad.com.au
GEE CORE LOG E24016FOR.GPJ GEE.GDT 19/8/24 9:01:32 PM

Borehole Log Report

Geo Environmental Engineering
82 Bridge Street
Lane Cove NSW 2066
T +61 2 9420 3361

Hole ID. **BH101**
Hole Depth: **10.23 m**
Sheet: **4 of 4**

Project Name: **PSI / Geotechnical Investigation**
Project Number: **E24016FOR**
Location / Site: **22 Melwood Avenue, Forestville NSW**
Client: **Forestville RSL**

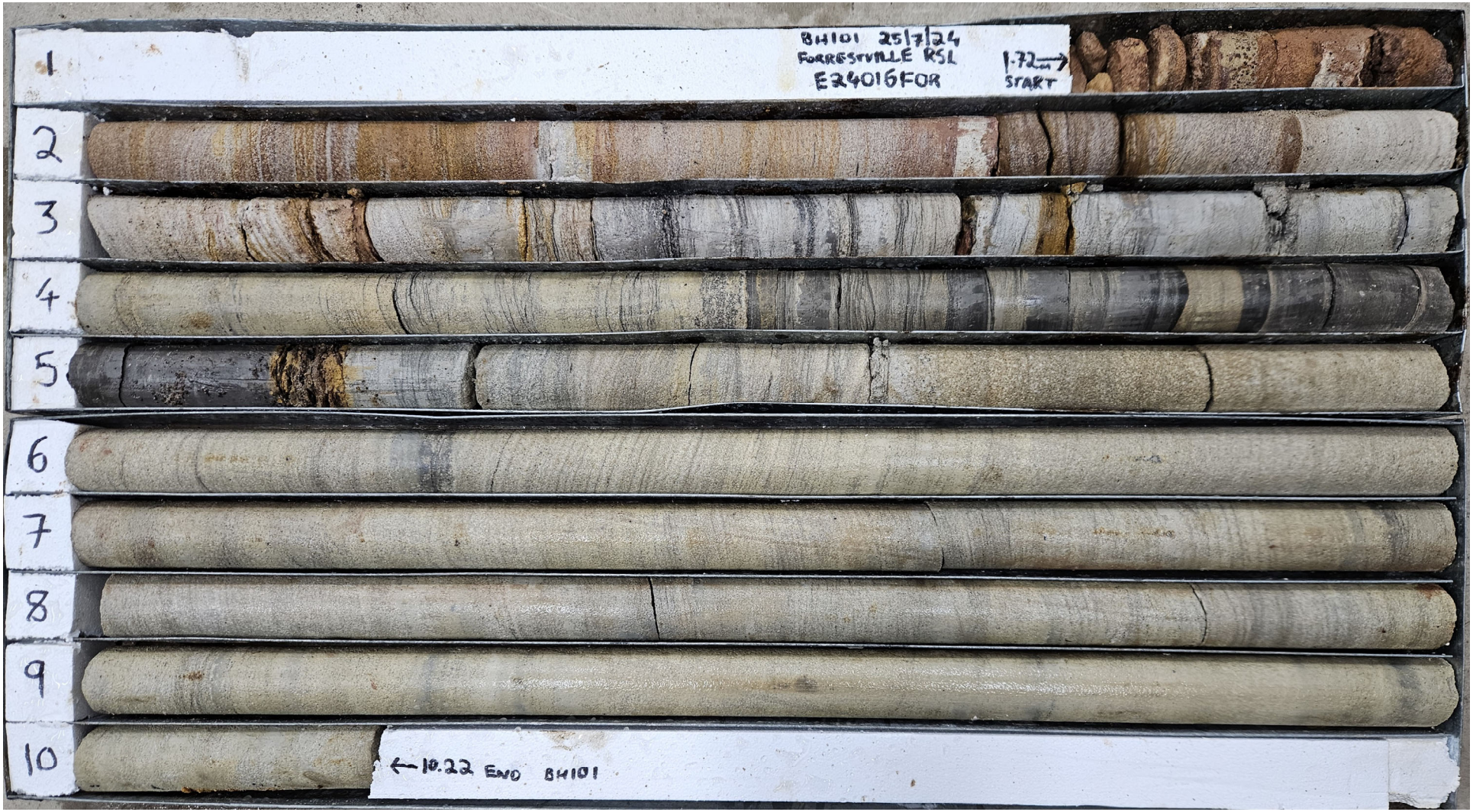
Drilling Company: **Geo Environmental Engineering**
Date Started: **25/07/2024**
Ground Level: **RL127.6m** approx
Drill Method: **SFA / NMLC**
Date Completed: **25/07/2024**
Easting: ----------
Equipment: **Hanjin D&B 8D**
Northing: ----------

Method	Water Level	Depth (m)	RL (m)	Graphic Log	Material Type	Material Description	Weathering	Estimated Strength (MPa) EL 0.03 VL 0.1 L 0.3 M 1 H 3 VH 10 EH	$Is_{(50)}$ MPa D=diametral A=axial	U.C.S. (Mpa)	Rock Mass Defects: RQD %	Core Photo	Defect Spacing (mm) 20 60 200 600 2000	Defect Description type, inclination, thickness, shape, roughness, coating: Specific / General	Well Details	Depth (m)	Casing & Core Lifts
NMLC		6.5	121.5		Bedrock	**SANDSTONE** - grey, fine to coarse grained.	FR		A=1.05 D=0.67		100					6.5	
		7.0	121.0						A=1.19 D=1.37					BD, 10, RG		7.0	
		7.5	120.5													7.5	
		8.0	120.0						A=1.11 D=1.26					BD, 10, RG		8.0	
		8.5	119.5													8.5	
		9.0	119.0						A=1.22 D=0.91		100					9.0	8.8
		9.5	118.5													9.5	
		10.0	118.0						A=1.08 D=0.87							10.0	
		10.5	117.5			**Hole Terminated at 10.23 m** target depth reached										10.5	10.23
		11.0	117.0													11.0	
		11.5	116.5													11.5	
		12.0	116.0													12.0	

Additional Comments

Logged By: **Zachary Ziesel** Date: **25/07/2024**
Checked By: **Stephen McCormack** Date: **19/08/2024**

drawn by: laurie.white@reumad.com.au
GEE CORE LOG E24016FOR.GPJ GEE.GDT 19/8/24 9:01:32 PM


BH101 25/7/24
FORRESTVILLE RSL
E24016FOR
1.72 START
1
2
3
4
5
6
7
8
9
10
← 10.22 END BH101

Borehole Log Report

Geo Environmental Engineering
2 / 5-7 Malta Street
Fairfield East NSW 2165
T +61 2 9420 3361

Hole ID. **BH102**
Hole Depth: **5.70 m**
Sheet: **1 of**

Project Name: **PSI / Geotechnical Investigation** Project Number: **E24016FOR**
Location / Site: **20 - 22 Melwood Avenue, Forestville NSW** Client: **Forestville RSL Club Ltd**

Drilling Company: **Geo Environmental Engineering** Date Started: **25/07/2024** Ground Level: **RL127.5m** (approx)
Drill Method: **SFA / NMLC** Date Completed: **25/07/2024** Easting: ----------
Equipment: **Hanjin D&B 8D** Northing: ----------

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Consistency / Density	Moisture	Samples / Tests ID No.	Samples / Tests SPT	Observations / Comments	Well Details	Well Construction
Solid Flight Auger		0	127.5		SP	Fill	**ASPHALT (80mm).**						0.00 0.05 0.15	
							FILL- Gravelly Sand, dark grey/grey, fine to coarse grained, fine to coarse sand and gravel, with silt.	loose	m	ZZ250724-02/ 100 0.1 -0.2m			
			127.0					medium dense to dense	m	ZZ250724-03 0.4 -0.5m	6 5 15 N=20			
		1	126.5		SP		**SAND**- red/grey, fine to medium grained, trace clay/silt. bands of extremely weathered to highly weathered sandstone with depth. predominately grey from 1.0m.			BH102-0.5 0.5 -0.6m			
			126.0							ZZ250724-04 1.0 -1.1m			1.00	Bentonite
		2	125.5				**SANDSTONE**- grey/red, fine to coarse grained, extremely to highly weathered.							
			125.0											
		3	124.5			Natural	*BH102 continued as cored hole from 2.58m*							
			124.0											
		4	123.5											
			123.0											
		5	122.5											
			122.0											
		6	121.5											

Moisture

D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

Logged By: **Zachary Ziesel** Date: **25/07/2024** Checked By: **Stephen McCormack** Date: **19/08/2024**

drawn by: laurie.white@reumad.com.au
GEE BH LOG 2 E24016FOR.GPJ GEE.GDT 20/8/24 7:19:09 PM

Borehole Log Report

Geo Environmental Engineering
82 Bridge Street
Lane Cove NSW 2066
T +61 2 9420 3361

Hole ID. **BH102**
Hole Depth: **5.70 m**
Sheet: **3 of 3**

Project Name: **PSI / Geotechnical Investigation**
Project Number: **E24016FOR**
Location / Site: **22 Melwood Avenue, Forestville NSW**
Client: **Forestville RSL**

Drilling Company: **Geo Environmental Engineering**
Date Started: **25/07/2024**
Ground Level: **RL127.5m** approx
Drill Method: **SFA / NMLC**
Date Completed: **25/07/2024**
Easting: ----------
Equipment: **Hanjin D&B 8D**
Northing: ----------

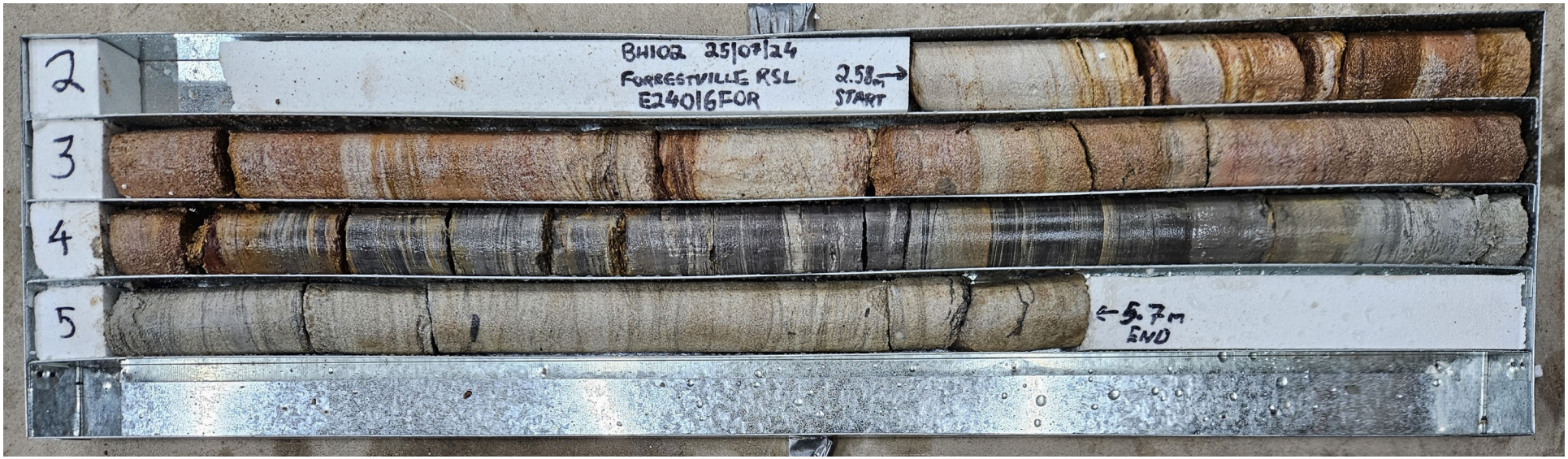
Method	Depth (m)	RL (m)	Material Description	Weathering	Estimated Strength (MPa)	$Is_{(50)}$ MPa	U.C.S. (Mpa)	RQD %	Defect Spacing (mm)	Defect Description (type, inclination, thickness, shape, roughness, coating)	Depth (m)
NMLC	0.5	127.0									0.5
	1.0	126.5									1.0
	1.5	126.0									1.5
	2.0	125.5									2.0
	2.5	125.0									2.5
	3.0	124.5	**SANDSTONE** - grey some red, orange, fine to coarse grained.	HW-MW		A=0.08 D=0.04		83		BD, 10, RG SM, CLAY BD, 10, RG, FE JT, 20, RG, FE	3.0
	3.5	124.0				A=0.13 D=0.03				SM, CLAY	3.5
	4.0	123.5				A=0.17				SM, CLAY BD, 3, RG, FE	4.0
	4.5	123.0	**SHALE** - dark grey, grey, with interbedded sandstone.	FR		A=0.54 D=0.14				SM, CLAY BD, 15, RG, FE BD, 1, RG SM, CLAY BD, 1,SMTH BD, 1,SMTH BD, 1,SMTH BD, 1,SMTH DB BD, 3, SMTH BD, 1, SMTH	4.5
	5.0	122.5	**SANDSTONE** - grey, fine to coarse grained.			A=0.71 D=0.57				SM, CLAY SM, CLAY BD, 3, RG BD, 3, RG	5.0
	5.5	122.0				A=2.3 D=0.92				BD, 10. RG	5.5
	6.0	121.5	**Hole Terminated at 5.70 m** target depth reached								6.0

Rock Mass Defects — Core Photo; Specific; General; Well Details; Casing & Core Lifts (5.7)

Additional Comments

Logged By: **Zachary Ziesel** Date: **25/07/2024**
Checked By: **Stephen McCormack** Date: **19/08/2024**

drawn by: laurie.white@reumad.com.au
GEE CORE LOG E24016FOR.GPJ GEE.GDT 19/8/24 9:01:33 PM


2
3
4
5
BH102 25/07/24
FORRESTVILLE RSL
E24016FOR
2.58m
START
5.7m
END

Geo Environmental Engineering
82 Bridge Street
Lane Cove NSW 2066
E info@geoenvironmental.com.au

Log Report Legend

MATERIAL SYMBOL

FILL	CONCRETE	ASPHALT	TOPSOIL
ORGANICS	ESTUARINE MUD		

CLAY	SAND	SILT	GRAVEL
Sandy CLAY	Clayey SAND	Clayey SILT	Clayey GRAVEL
Silty CLAY	Silty SAND	Sandy SILT	Sandy GRAVEL
Gravelly CLAY	Gravelly SAND	Gravelly SILT	Silty GRAVEL
CLAY & SAND	SAND & CLAY	SILT & CLAY	GRAVEL & CLAY
CLAY & SILT	SAND & SILT	SILT & SAND	GRAVEL & SAND
CLAY & GRAVEL	SAND & GRAVEL	SILT & GRAVEL	GRAVEL & SILT
Sandy Silty CLAY	Clayey Silty SAND	Sandy Clayey SILT	Sandy Clayey GRAVEL
Silty Sandy CLAY	Silty Clayey SAND	Clayey Sandy SILT	Clayey Sandy GRAVEL
Sandy Gravelly CLAY	Clayey Gravelly SAND	Sandy Gravelly SILT	Silty Clayey GRAVEL
Silty Gravelly CLAY	Silty Gravelly SAND	Clayey Gravelly SILT	Clayey Silty GRAVEL
Gravelly Silty CLAY	Gravelly Silty SAND	Gravelly Clayey SILT	Sandy Silty GRAVEL
Gravelly Sandy CLAY	Gravelly Clayey SAND	Gravelly Sandy SILT	Silty Sandy GRAVEL

SANDSTONE	SHALE	GRANITE	BASALT	SHALE / SANDSTONE
PORCELLANITE	GNEISS	SHALE / CLAYSTONE	MUDSTONE	
CLAYSTONE	MUDSTONE / CLAYSTONE	SHALE / SILTSTONE	IRONSTONE	

WATER LEVELS

Encountered Water

Standing Water

ABBREVIATIONS

PT	Pushtube
SFA	Solid Flight Auger
PWS	Percussion Window Sampler
HA	Hand Auger
HFA	Hollow Flight Auger

WELL GRAPHICS

Cuttings	Bentonite	Screen
Gravel Pack	Grout	Cave-in

GEE LEGEND * * 29/10/09 5:04:07 PM

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 1
1 / 2

BOREHOLE LOG

Client: FORESTVILLE RSL CLUB LTD
Project: PROPOSED PRIVATE MEDICAL CENTRE
Location: 22 MELWOOD AVENUE, FORESTVILLE, NSW

Job No.: 31993BM **Method:** SPIRAL AUGER **R.L. Surface:** ~126.5 m
Date: 16/11/18 **Datum:** AHD
Plant Type: JK205 **Logged/Checked By:** J.B.J/M.P.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
										CONCRETE: 100mm.t				5mm.t DIAMETER REINFORCMENT 50mm TOP COVER
									-	FILL: Silty sand, fine to medium grained, dark brown.	M			APPEARS POORLY COMPACTED
					N > 0 2,0/ 150mm REFUSAL	126								
							1		-	Extremely Weathered sandstone: silty SAND, fine to medium grained, purple grey, trace of ironstone gravel and clay.	XW	VD		HAWKESBURY SANDSTONE
						125								
										SANDSTONE: fine to medium grained, light grey with dark grey bands.	DW	VL		VERY LOW 'TC' BIT RESISTANCE
							2					VL - L		VERY LOW TO LOW RESISTANCE
						124						L		LOW RESISTANCE
										REFER TO CORED BOREHOLE LOG				Groundwater monitoring well installed to 9.0m. Class 18 machine slotted PVC standpipe 9.0m to 3.0m. Casing 3.0m to 0.15m. 2mm sand filter pack 9.0m to 1.4m. Bentonite seal 1.4m to 0.1m. Completed with a concreted gatic cover
							3							
						123								
							4							
						122								
							5							
						121								
							6							
						120								

JK 9.01.2 LIB:GLB Log JK AUGERHOLE - MASTER 31993BM FORESTVILLE.GPJ <<DrawingFile>> 30/11/2018 15:55 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: JK 9.01.2 2018-04-02 Prj: JK 9.01.0 2018-03-20

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 1 2 / 2

CORED BOREHOLE LOG

Client: FORESTVILLE RSL CLUB LTD
Project: PROPOSED PRIVATE MEDICAL CENTRE
Location: 22 MELWOOD AVENUE, FORESTVILLE, NSW

Job No.: 31993BM **Core Size:** NMLC **R.L. Surface:** ~126.5 m
Date: 16/11/18 **Inclination:** VERTICAL **Datum:** AHD
Plant Type: JK205 **Bearing:** N/A **Logged/Checked By:** J.B.J/M.P.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$	DEFECT DETAILS: SPACING (mm)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
		124			START CORING AT 2.88m						
			3		SANDSTONE: fine to medium grained, light grey with dark grey banding, orange and purple staining, bedding at 5-15°.	HW	L - M	0.40		(2.95m) XWS, 0°, 50 mm.t (3.08m) J, 15°, St, R, Fe Sn (3.36m) Be, 0°, P, Fe Sn	
		123			NO CORE 0.10m						
			4		SANDSTONE: fine to medium grained, light grey with orange and purple staining, and a very high strength iron indurated band.	HW	L - M	0.30 0.20		(3.78m) Be, 10°, P, R, Fe Sn (3.82m) J, 30°, P, R, Fe Sn, 1cm IN FILL (4.44m) CS, 100 mm.t (4.51m) XWS, 150 mm.t	
		122				MW	VH	3.0			
100% RETURN			5		as above, but light grey with dark grey bands, bedding at 5-15°.	FR	M	1.9 6.8 0.30		(4.90m) J, 0°, Ir, R, Fe Sn	
		121						0.50		(5.56m) Be, 2°, C, R, XWS 1mm.t	
			6					0.90			
		120					M - H	1.2		(6.78m) CS, 1 mm.t	
			7					1.0		(7.09m) CS, 1 mm.t	
		119						0.90			
			8					1.0		(7.95m) Be, 0°, Ir, R, Cb, 1 mm.t	
		118						1.2		(8.88m) Be, 0°, P, R, Qz Vn	Hawkesbury Sandstone

END OF BOREHOLE AT 9.00 m

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JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 2
1 / 2

BOREHOLE LOG

Client: FORESTVILLE RSL CLUB LTD
Project: PROPOSED PRIVATE MEDICAL CENTRE
Location: 22 MELWOOD AVENUE, FORESTVILLE, NSW

Job No.: 31993BM **Method:** SPIRAL AUGER **R.L. Surface:** ~126.2 m
Date: 12/11/18 **Datum:** AHD
Plant Type: JK205 **Logged/Checked By:** J.B.J/M.P.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION						126				CONCRETE: 140mm.t.				REINFORCEMENT 10mm.t. TOP COVER 100mm.t
									-	FILL: Silty sand, fine to medium grained, dark brown.	M			
					N = 5 2,2,3		1			FILL: Silty sand, fine to medium grained, light brown.				APPEARS POORLY COMPACTED
						125								
					N=SPT 18/ 150mm REFUSAL									
1HR AFTER CORING						124	2		-	Extremely Weathered sandstone: Silty SAND, fine to medium grained, light grey mottled pink, trace of clay bands.	XW	VD		HAWKESBURY SANDSTONE
							3							
						123				SANDSTONE: fine to medium grained, light orange grey.	DW	L		LOW 'TC' BIT RESISTANCE
										REFER TO CORED BOREHOLE LOG				
						122	4							
							5							
						121								
							6							
						120								

JK 9.01.2 LIB:GLB Log JK AUGERHOLE - MASTER 31993BM FORESTVILLE.GPJ <<DrawingFile>> 30/11/2018 15:55 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: JK 9.01.2 2018-04-02 Prj: JK 9.01.0 2018-03-20

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 2
2 / 2

CORED BOREHOLE LOG

Client: FORESTVILLE RSL CLUB LTD
Project: PROPOSED PRIVATE MEDICAL CENTRE
Location: 22 MELWOOD AVENUE, FORESTVILLE, NSW

Job No.: 31993BM | **Core Size:** NMLC | **R.L. Surface:** ~126.2 m
Date: 12/11/18 | **Inclination:** VERTICAL | **Datum:** AHD
Plant Type: JK205 | **Bearing:** N/A | **Logged/Checked By:** J.B.J/M.P.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION (Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components)	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$	DEFECT DETAILS: SPACING (mm)	DEFECT DETAILS: DESCRIPTION (Type, orientation, defect roughness and shape, defect coatings and seams, openness and thickness) Specific / General	Formation
		123			START CORING AT 3.55m						
100% RETURN					NO CORE 0.24m						
		122	4		SANDSTONE: fine to medium grained, light grey with dark grey banding, bedding at 0°, trace of iron indurated bands.	HW	VL - L	0.050 0.060 0.30 0.20		(3.79m) XWS, 0°, 5 mm.t (3.88m) CS, 0°, 10 mm.t (4.22m) XWS, 0°, 90 mm.t (4.44m) CS, 0°, 10 mm.t (4.56m) Be, 0°, C, R, Fe Sn, 1 mm.t (4.92m) J, 5°, C, R, Cn	Hawkesbury Sandstone
		121	5			SW	M	0.70		(5.67m) CS, 0°, 10 mm.t	
		120	6		SANDSTONE: fine to medium grained, light grey with dark grey, bedding at 5-30°, trace of fine to coarse grained bands.			0.90		(6.27m) CS, 0°, 10 mm.t	
							H	1.8		(6.76m) J, 10°, P, S, Cn	
		119	7			FR		1.2		(7.10m) Be, 0°, P, Cb Cn, 1 mm.t	
		118	8					0.80 1.2		(8.09m) Be, 1°, St, R, Cn	
		117	9		END OF BOREHOLE AT 8.92 m			1.1			

JK 9.01.2 LIB:GLB Log, JK CORED BOREHOLE - MASTER 31993BM FORESTVILLE.GPJ <<DrawingFile>> 30/11/2018 15:56 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: JK 9.01.2 2018-04-02 Prj: JK 9.01.0 2018-03-20

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Borehole No. 3
1 / 2

BOREHOLE LOG

Client: FORESTVILLE RSL CLUB LTD
Project: PROPOSED PRIVATE MEDICAL CENTRE
Location: 22 MELWOOD AVENUE, FORESTVILLE, NSW

Job No.: 31993BM **Method:** SPIRAL AUGER **R.L. Surface:** ~126.2 m
Date: 12/11/18 **Datum:** AHD
Plant Type: JK205 **Logged/Checked By:** J.B.J/M.P.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
										CONCRETE: 140mm.t				REINFORCEMENT: 10mm.t TOP COVER 100mm.t
						126			-	FILL: Silty sand, fine to medium grained, dark brown, trace clay and brick fragments.	M			APPEARS POORLY COMPACTED
					N = 12 2,2,10					FILL: Silty sand, fine to medium grained, light brown.				
							1		-	Extremely Weathered sandstone: Silty SAND, fine to medium grained, light grey.	XW	VD		HAWKESBURY SANDSTONE
						125								
							2			SANDSTONE: fine to medium grained, light grey with extremely weathered bands.	DW	VL		VERY LOW 'TC' BIT RESISTANCE
						124								
							3							
						123				SANDSTONE: fine to medium grained. light grey with dark grey bands, trace o fextremely weathered bands.		VL - L		VERY LOW RESISTANCE WITH LOW BANDS
										REFER TO CORED BOREHOLE LOG				
							4							
						122								
							5							
						121								
							6							
						120								

JK 9.01.2 LIB.GLB Log JK AUGERHOLE - MASTER 31993BM FORESTVILLE.GPJ <<DrawingFile>> 30/11/2018 15:56 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: JK 9.01.2 2018-04-02 Prj: JK 9.01.0 2018-03-20

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

Borehole No. 3
2 / 2

CORED BOREHOLE LOG

Client: FORESTVILLE RSL CLUB LTD
Project: PROPOSED PRIVATE MEDICAL CENTRE
Location: 22 MELWOOD AVENUE, FORESTVILLE, NSW

Job No.: 31993BM | **Core Size:** NMLC | **R.L. Surface:** ~126.2 m
Date: 12/11/18 | **Inclination:** VERTICAL | **Datum:** AHD
Plant Type: JK205 | **Bearing:** N/A | **Logged/Checked By:** J.B.J/M.P.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$	DEFECT DETAILS: SPACING (mm)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
		123			START CORING AT 3.72m						
100% RETURN		122	4		NO CORE 0.07m SANDSTONE: fine to medium grained, light grey mottled pink/orange, bedding at 1-3°.	HW MW	VL L - M	0.10 0.10 0.60 0.060 0.40		(3.79m) XWS, 0°, 140 mm.t (4.13m) Be, 3°, Ir, R, Clay, 1 mm.t (4.18m) Be, 3°, Ir, R, Cn (4.45m) CS, 0°, 10 mm.t (5.24m) XWS, 0°, 5 mm.t (5.48m) Be, 5°, P, R, Fe Sn (5.60m) XWS, 0°, 10 mm.t	
		121	5								
		120	6		SANDSTONE: fine to medium grained, light grey with dark grey banding, bedding at 5-10°.	FR	M - H	0.70 1.6 0.60 1.1 0.70 0.50		(5.92m) Be, 0°, P, R, Cn (7.85m) Be, 2°, P, R, Cb Vn (8.07m) Be, 0°, P, R, Cb Cn, 1 mm.t (8.92m) Be, 2°, P, R, Cb Cn, 1 mm.t	Hawkesbury Sandstone
		119	7								
		118	8								
		117	9		END OF BOREHOLE AT 8.98 m						

JK 9.01.2 LIB.GLB Log JK CORED BOREHOLE - MASTER 31993BM FORESTVILLE.GPJ <<DrawingFile>> 30/11/2018 15:56 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: JK 9.01.2 2018-04-02 Prj: JK 9.01.0 2018-03-20

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APPENDIX C

DATA QUALITY OBJECTIVES

INTRODUCTION

The Data Quality Objectives (DQOs) process was used to define the type, quantity and quality of the data needed to support decisions relating to the environmental condition of a site (reference 1). The process consists of seven steps, with the output from each step influencing the choices that will be made later in the process.

According to USEPA (reference 2), DQOs are qualitative and quantitative statements, derived from the first six steps of the process, that:

- ◊ Clarify the study objective,
- ◊ Define the most appropriate type of data to collect,
- ◊ Determine the most appropriate conditions from which to collect the data, and
- ◊ Specify tolerable limits on decision errors which will be used as the basis for establishing the quantity and quality of data needed to support the decision.

The DQOs are then used to develop a scientific and resource-effective data collection design.

STEP 1 - STATE THE PROBLEM

The problem is the potential for the site to be impacted by contamination caused by past activities undertaken on or adjacent to the site, at levels in excess of those permissible for the proposed land-use, and which could impact upon anticipated receiving environments and the future users of the site (both short term during redevelopment works and long-term during occupation of the site). Further detail is provided in the Conceptual Site Model.

STEP 2 - IDENTIFY THE DECISION STATEMENT

The following decision were required to be made:

- ◊ Does the dataset adequately characterise the site for the purpose of assessing the suitability of the site for the proposed land uses and (if required) remedial options?
- ◊ Is the dataset sufficient to enable the preparation of defensible RAP for the site (if required)?



- ◊ Do the concentrations of potential contaminants in the soil (fill and natural soil) exceed acceptable levels for the proposed land-use?
- ◊ Are there any aesthetic issues relating to the fill and natural soils at the site?
- ◊ Is the data reliable?

STEP 3 - IDENTIFY INPUTS TO THE DECISION

The following information inputs are required to resolve the decision statement:

- ◊ Proposed development and the associated land usage,
- ◊ Detailed site inspection for sources of potential contamination,
- ◊ A review of the environmental and physical setting in which the site lies, including geology, hydrogeology, and topography,
- ◊ Review of the history of the site and surrounding land to research potential contaminating activities on the site or on nearby sites,
- ◊ The drilling of boreholes in a judgemental pattern across the site (subject to access and utility constraints) while also targeting any areas of concern,
- ◊ Collection of environmental soil samples using appropriate methods. This includes from the stockpile located in the eastern corner,
- ◊ Analysis of soil samples for the contaminants of concern identified by the history search and site inspection,
- ◊ Analysis of any surface or buried fibro samples to confirm the presence of asbestos fibres,
- ◊ Comparison of the results with relevant Site Assessment Criteria (SAC) as defined in the main body of the report, and
- ◊ Accurate measurements of sample locations to allow for accurate mapping and contouring of contamination (if identified).

STEP 4 - DEFINE THE BOUNDARIES OF THE STUDY

The site covers an area of approximately 8,970m^2 (by calculation) and encompasses the following legal allotments:

- ◊ Lot 31 Deposited Plan (DP) 366454 (No. 20 Melwood Ave)
- ◊ No. 22: Lot 2589 DP 752038 (No. 22 Melwood Ave)

The site boundaries are shown on the survey plan provided as Appendix A.

The vertical extent of this preliminary and detailed study is approximately 0.5m into the natural soil profile or surface of the bedrock. The temporal boundary of the assessment is defined as the time between commencement and final sample collection.

STEP 5 - DEVELOP A DECISION RULE

The decision rules for this investigation are as follows:

- If it is determined that the data generated through this investigation are reliable and adequately characterise soil conditions at the site, the data will be compared against the adopted Site Assessment Criteria (SAC),
- If all the data meets the adopted SAC, then the site will be considered suitable for the proposed development,
- If the data do not meet the adopted SAC, then further investigations or the development of an RAP will be recommended as a basis for making the site suitable for the proposed development. Further investigations may include:
    - Additional soil or groundwater sampling points to delineate impacts,
    - Analysis of soil and/or groundwater for additional analytes/CoPC,
    - Undertaking soil vapour investigations, and/or
    - Undertaking a human health and/or ecological risk assessment to assess site suitability and, if not suitable, assess the requirement for remediation and/or management.

If it is determined that the data generated through this investigation are not reliable and/or do not suitably characterise the site, then further investigations may be recommended prior to comparison against the SAC and GAC.

STEP 6 - SPECIFY ACCEPTABLE LIMITS ON DECISION ERRORS

Acceptable limits on decision errors must be applied based on the Data Quality Indicators (DQIs) pertaining to precision, accuracy, representativeness, comparability and completeness.

The null hypothesis is that the material is contaminated and exceeds the adopted criteria. The alternative hypothesis is that the material is not contaminated above the adopted criteria.

Possible decision errors include:

- ◊ the material being accepted as suitable for the proposed land use when it is not, thereby potentially risking human health or environmental impacts
- ◊ unnecessary disposal of the material offsite, imposing needless financial and resource burdens on the development project and resulting in an inappropriate waste classification.

Stated hypotheses:

- ◊ null hypothesis (H_0): the 95% UCL, and other requirements, are > the action level
- ◊ alternate hypothesis (H_A): the 95% UCL, and other requirements, are ≤ the action level.

Potential outcomes include Type I and Type II errors:

- ◊ Type I error of determining the material is acceptable for the proposed land use when it is not (wrongly rejects true H0).
- ◊ Type II error of determining the material is unacceptable for the proposed land use when it is acceptable (wrongly accepts false H0).

The more severe consequences are with decision error (1) since the risk of jeopardising human health outweighs the consequences of paying more for remediation.

For performance criteria, the acceptable limits on the likelihood of making decision errors to be applied are:

- ◊ alpha risk (Type I error) of $\alpha = 0.05$

◊ beta risk (Type II error) of β = 0.2.

No previously collected data are available for use, therefore acceptance criteria are not required.

STEP 7 - OPTIMISING THE DESIGN FOR OBTAINING DATA

The purpose of this step is to identify a resource-effective data collection design for generating data that are expected to satisfy the DQOs.

To ensure the design satisfies the DQOs a comprehensive Quality Assurance and Quality Control Plan will be implemented.

References

1. NSW EPA, 2017: New South Wales Environment Protection Authority (2017): Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (3rd edition).
2. USEPA, 2000: *Guidance for Data Quality Objectives Process*. EPA QA/G-4.

APPENDIX D

GEE BOREHOLE LOGS

Borehole Log Report

Geo Environmental Engineering
Unit 2 / 5 - 7 Malta Street
Fairfield East NSW 2165
T 02 9420 3361

Hole ID. **BH201**
Hole Depth: **0.25 m**
Sheet: **1 of 1**

Project Name: **Site Contamination Investigation**
Project Number: **E24016FOR**
Location / Site: **20 - 22 Melwood Avenue, Forestville NSW**
Client: **Forestville RSL Club Ltd**

Drilling Company: **Geo Environmental Engineering**
Date Started: **3/06/2025**
Ground Level: ----------
Drill Method: **Hand Auger**
Date Completed: **3/06/2025**
Easting: ----------
Equipment: **Manual**
Northing: ----------

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Samples / Tests ID No.	Observations / Comments
DT						Fill	**CONCRETE**- 120mm.		
HA						Fill	**FILL**- Sandy GRAVEL, blue-grey and brown, fine to coarse grained, fine to coarse sand.	SM030625-69 / 105 0.15-0.25m	
		0.5					**Refusal at 0.25m** on sandstone bedrock		
		1.0							
		1.5							
		2.0							

Moisture

D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

Logged By: **Stephen McCormack** Date: **3/06/2025**
Checked By: **Stephen McCormack** Date: **12/06/2025**

GEE DAVIES BH LOG E24016FOR.GPJ GEE.GDT 15/6/25 2:52:34 PM

Borehole Log Report

Geo Environmental Engineering
Unit 2 / 5 - 7 Malta Street
Fairfield East NSW 2165
T 02 9420 3361

Hole ID. **BH202**
Hole Depth: **0.90 m**
Sheet: **1 of 1**

Project Name: **Site Contamination Investigation**
Project Number: **E24016FOR**
Location / Site: **20 - 22 Melwood Avenue, Forestville NSW**
Client: **Forestville RSL Club Ltd**

Drilling Company: **Geo Environmental Engineering**
Date Started: **3/06/2025**
Ground Level: ----------
Drill Method: **Hand Auger**
Date Completed: **3/06/2025**
Easting: ----------
Equipment: **Manual**
Northing: ----------

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests ID No.	Observations / Comments
DT							**CONCRETE**- 150mm.			
Hand Auger		0.5				Fill	**FILL**- Gravelly SAND, brown, fine to coarse grained, with fine to coarse gravel, some fines (silt & clay) and trace sandstone cobbles.	m	SM030625-50 / 100 0.15-0.30m	
						Natural	**SAND**- grey / orange / red, fine to medium grained, with trace clay and gravel (extremely weathered sandstone).		SM030625-51 0.80-0.90m	
		1.0					**Refusal at 0.90m** on sandstone bedrock			
		1.5								
		2.0								

Moisture

D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

Logged By: **Stephen McCormack** Date: **3/06/2025**
Checked By: **Stephen McCormack** Date: **12/06/2025**

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Borehole Log Report

Geo Environmental Engineering
Unit 2 / 5 - 7 Malta Street
Fairfield East NSW 2165
T 02 9420 3361

Hole ID. **BH203**
Hole Depth: **0.14 m**
Sheet: **1 of 1**

Project Name: **Site Contamination Investigation**
Project Number: **E24016FOR**
Location / Site: **20 - 22 Melwood Avenue, Forestville NSW**
Client: **Forestville RSL Club Ltd**

Drilling Company: **Geo Environmental Engineering**
Date Started: **3/06/2025**
Ground Level: ----------
Drill Method: **Hand Auger**
Date Completed: **3/06/2025**
Easting: ----------
Equipment: **Manual**
Northing: ----------

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Observations / Comments
DT						Fill	**CONCRETE**- 140mm.	
		0.5					**Refusal at 0.14m** on sandstone bedrock	
		1.0						
		1.5						
		2.0						

Moisture	
D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

Logged By: **Stephen McCormack** Date: **3/06/2025**
Checked By: **Stephen McCormack** Date: **12/06/2025**

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Borehole Log Report

Geo Environmental Engineering
Unit 2 / 5 - 7 Malta Street
Fairfield East NSW 2165
T 02 9420 3361

Hole ID. **BH204**
Hole Depth: **2.20 m**
Sheet: **1 of 2**

Project Name: **Site Contamination Investigation** Project Number: **E24016FOR**
Location / Site: **20 - 22 Melwood Avenue, Forestville NSW** Client: **Forestville RSL Club Ltd**

Drilling Company: **Geo Environmental Engineering** Date Started: **3/06/2025** Ground Level: ----------
Drill Method: **Hand Auger** Date Completed: **3/06/2025** Easting: ----------
Equipment: **Manual** Northing: ----------

Method	Depth (m)	Material Description	Moisture	Samples / Tests ID No.	Observations / Comments
Hand Auger	0.5	**FILL**- Silty SAND, dark brown, fine to medium grained, trace rootlets.	sm	SM030625-01 0.05-0.15m SM030625-02 0.30-0.40m	
	1.0	**FILL**- SAND, brown, fine to medium grained.	sm	SM030625-03 0.50-0.60m	
	1.5	**FILL**- Clayey SAND, grey, light brown & mottled brown, fine to coarse grained, with basalt / blue metal gravel and cobbles and trace brick fragments.	sm	SM030625-04 0.90-1.00m	
	2.0	**FILL**- GRAVEL, dark grey, medium to coarse gravel (blue metal) with some fine to coarse sand.	m		

Water Level: —
Graphic Log: Fill
USCS Symbol: —
Material Type: Fill

Moisture

D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

Logged By: **Sean Gao** Date: **3/06/2025** Checked By: **Stephen McCormack** Date: **12/06/2025**

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Borehole Log Report

Geo Environmental Engineering
Unit 2 / 5 - 7 Malta Street
Fairfield East NSW 2165
T 02 9420 3361

Hole ID. **BH204**
Hole Depth: **2.20 m**
Sheet: **2 of 2**

Project Name: **Site Contamination Investigation**
Project Number: **E24016FOR**
Location / Site: **20 - 22 Melwood Avenue, Forestville NSW**
Client: **Forestville RSL Club Ltd**

Drilling Company: **Geo Environmental Engineering**
Date Started: **3/06/2025**
Ground Level: ----------
Drill Method: **Hand Auger**
Date Completed: **3/06/2025**
Easting: ----------
Equipment: **Manual**
Northing: ----------

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests ID No.	Observations / Comments
Hand Auger						Fill	**FILL**- GRAVEL, dark grey, medium to coarse gravel (blue metal) with some fine to coarse sand.*(continued)* becoming wet from 2.0m.	m	SM030625-05 2.00-2.20m	
		2.5					**Hole Terminated at 2.20m** Caused by the collapse of the gravel layer			
		3.0								
		3.5								
		4.0								

Moisture

D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

Logged By: **Sean Gao** Date: **3/06/2025**
Checked By: **Stephen McCormack** Date: **12/06/2025**

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Borehole Log Report

Geo Environmental Engineering
Unit 2 / 5 - 7 Malta Street
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Hole ID. **BH205**
Hole Depth: **1.40 m**
Sheet: **1 of 1**

Project Name: **Site Contamination Investigation**
Project Number: **E24016FOR**
Location / Site: **20 - 22 Melwood Avenue, Forestville NSW**
Client: **Forestville RSL Club Ltd**

Drilling Company: **Geo Environmental Engineering**
Date Started: **3/06/2025**
Ground Level: ----------
Drill Method: **Hand Auger**
Date Completed: **3/06/2025**
Easting: ----------
Equipment: **Manual**
Northing: ----------

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests ID No.	Observations / Comments
Hand Auger		0.5				Fill	**FILL**- Silty SAND, dark brown, fine to medium grained, trace rootlets.	sm	SM030625-06 0.05-0.20m SM030625-07 0.30-0.40m	
							FILL- SAND, brown, fine to medium grained.	sm	SM030625-08 / 103 0.40-0.50m	
		1.0					**FILL**- Clayey SAND, grey mottled orange brown, fine to coarse grained, with some fine to coarse gravel.	m	SM030625-09 0.80-0.90m	
							FILL- GRAVEL, dark grey, medium to coarse gravel (blue metal) with some fine to coarse sand.	m	SM030625-10 1.30-1.40m	
		1.5					**Hole Terminated at 1.40m** Caused by the collapse of the gravel layer			
		2.0								

Moisture

D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

Logged By: **Sean Gao** Date: **3/06/2025**
Checked By: **Stephen McCormack** Date: **12/06/2025**

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Borehole Log Report

Geo Environmental Engineering
Unit 2 / 5 - 7 Malta Street
Fairfield East NSW 2165
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Hole ID. **BH206**
Hole Depth: **0.70 m**
Sheet: **1 of 1**

Project Name: **Site Contamination Investigation** Project Number: **E24016FOR**
Location / Site: **20 - 22 Melwood Avenue, Forestville NSW** Client: **Forestville RSL Club Ltd**

Drilling Company: **Geo Environmental Engineering** Date Started: **3/06/2025** Ground Level: ----------
Drill Method: **Hand Auger** Date Completed: **3/06/2025** Easting: ----------
Equipment: **Manual** Northing: ----------

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests ID No.	Observations / Comments
Hand Auger		0.5				Fill	**FILL**- Silty SAND, dark brown, fine to medium grained, trace rootlets.	sm	SM030625-11 0.05-0.20m	
							FILL- SAND, brown, fine to medium grained.	m	SM030625-12 / 104 0.40-0.50m	
						Natural	**Clayey SAND**- light brown - yellow, low to medium plasticity.	m	SM030625-13 0.55-0.65m	
		1.0 / 1.5 / 2.0					**Refusal at 0.70m** on sandstone bedrock			

Moisture	
D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

Logged By: **Sean Gao** Date: **3/06/2025** Checked By: **Stephen McCormack** Date: **12/06/2025**

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Borehole Log Report

Geo Environmental Engineering
Unit 2 / 5 - 7 Malta Street
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Hole ID. **BH207**
Hole Depth: **1.30 m**
Sheet: **1 of 1**

Project Name: **Site Contamination Investigation**
Project Number: **E24016FOR**
Location / Site: **20 - 22 Melwood Avenue, Forestville NSW**
Client: **Forestville RSL Club Ltd**

Drilling Company: **Geo Environmental Engineering**
Date Started: **3/06/2025**
Ground Level: ----------
Drill Method: **Hand Auger**
Date Completed: **3/06/2025**
Easting: ----------
Equipment: **Manual**
Northing: ----------

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests ID No.	Observations / Comments
Hand Auger		0.0				Fill	**FILL**- Silty SAND, dark brown, fine to medium grained, trace rootlets.	sm	SM030625-14 0.05-0.20m	
		0.5					**FILL**- SAND, brown, fine to medium grained.	sm	SM030625-15 0.40-0.50m	
		1.0					**FILL**- Clayey SAND, grey, fine to coarse grained, with low to medium plasticity clay, trace blue metals and having an organic smell. borehole is wet from 1.1m with presence of black rotten woodchips.	m	SM030625-16 0.70-0.80m SM030625-17 1.20-1.30m	
		1.5					**Refusal at 1.30m** on the inferred surface of the sandstone bedrock			
		2.0								

Moisture	
D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

Logged By: **Sean Gao** Date: **3/06/2025**
Checked By: **Stephen McCormack** Date: **12/06/2025**

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Borehole Log Report

Geo Environmental Engineering
Unit 2 / 5 - 7 Malta Street
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Hole ID. **BH208**
Hole Depth: **0.90 m**
Sheet: **1 of 1**

Project Name: **Site Contamination Investigation** Project Number: **E24016FOR**
Location / Site: **20 - 22 Melwood Avenue, Forestville NSW** Client: **Forestville RSL Club Ltd**

Drilling Company: **Geo Environmental Engineering** Date Started: **3/06/2025** Ground Level: ----------
Drill Method: **Hand Auger** Date Completed: **3/06/2025** Easting: ----------
Equipment: **Manual** Northing: ----------

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests ID No.	Observations / Comments
Hand Auger		0.5				Fill	**FILL**- Silty SAND, dark brown, fine to medium grained, trace rootlets.	sm	SM030625-22 0.05-0.20m	
						Fill	**FILL**- Clayey SAND, light brown and yellow, fine to coarse grained, with some gravel and cobbles.	sm	SM030625-23 0.30-0.40m	
						Natural	**SAND**- pale grey, white, fine to coarse grained, with trace gravel. becoming orange red from 0.8m (ew sandstone).	sm	SM030625-24 0.70-0.80m	
		1.0 1.5 2.0					**Refusal at 0.90m** on sandstone bedrock			

Moisture

D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

Logged By: **Sean Gao** Date: **3/06/2025** Checked By: **Stephen McCormack** Date: **12/06/2025**

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Borehole Log Report

Geo Environmental Engineering
Unit 2 / 5 - 7 Malta Street
Fairfield East NSW 2165
T 02 9420 3361

Hole ID. **BH209**
Hole Depth: **0.75 m**
Sheet: **1 of 1**

Project Name: **Site Contamination Investigation**
Project Number: **E24016FOR**
Location / Site: **20 - 22 Melwood Avenue, Forestville NSW**
Client: **Forestville RSL Club Ltd**

Drilling Company: **Geo Environmental Engineering**
Date Started: **3/06/2025**
Ground Level: ----------
Drill Method: **Hand Auger**
Date Completed: **3/06/2025**
Easting: ----------
Equipment: **Manual**
Northing: ----------

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests ID No.	Observations / Comments
Hand Auger		0.0				Fill	**FILL**- Silty SAND, dark brown, fine to medium grained, trace rootlets.	sm	SM030625-19 0.05-0.20m	
		0.5				Fill	**FILL**- SAND, brown, fine to medium grained, trace rootlets.	m	SM030625-20 0.40-0.50m	
						Natural	**Clayey SAND**- light brown / orange brown, fine to medium grained.	sm	SM030625-21 0.60-0.70m	
		1.0					**Hole Terminated at 0.75m** target depth reached			
		1.5								
		2.0								

Moisture

D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

Logged By: **Sean Gao** Date: **3/06/2025**
Checked By: **Stephen McCormack** Date: **12/06/2025**

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Borehole Log Report

Geo Environmental Engineering
Unit 2 / 5 - 7 Malta Street
Fairfield East NSW 2165
T 02 9420 3361

Hole ID. **BH210**
Hole Depth: **0.40 m**
Sheet: **1 of 1**

Project Name: **Site Contamination Investigation** Project Number: **E24016FOR**
Location / Site: **20 - 22 Melwood Avenue, Forestville NSW** Client: **Forestville RSL Club Ltd**

Drilling Company: **Geo Environmental Engineering** Date Started: **3/06/2025** Ground Level: ----------
Drill Method: **Hand Auger** Date Completed: **3/06/2025** Easting: ----------
Equipment: **Manual** Northing: ----------

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests ID No.	Observations / Comments
DT						Fill	**CONCRETE**- 140mm.			
Hand Auger						Fill	**FILL**- Gravelly SAND, light grey, fine to coarse grained, with some cobbles.	m	SM030625-18 0.14-0.30m	
		0.5					**Refusal at 0.40m** on sandstone bedrock			
		1.0								
		1.5								
		2.0								

Moisture	
D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

Logged By: **Sean Gao** Date: **3/06/2025** Checked By: **Stephen McCormack** Date: **12/06/2025**

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Borehole Log Report

Geo Environmental Engineering
Unit 2 / 5 - 7 Malta Street
Fairfield East NSW 2165
T 02 9420 3361

Hole ID. **BH211**
Hole Depth: **1.00 m**
Sheet: **1 of 1**

Project Name: **Site Contamination Investigation**
Project Number: **E24016FOR**
Location / Site: **20 - 22 Melwood Avenue, Forestville NSW**
Client: **Forestville RSL Club Ltd**

Drilling Company: **Geo Environmental Engineering**
Date Started: **3/06/2025**
Ground Level: ----------
Drill Method: **Hand Auger**
Date Completed: **3/06/2025**
Easting: ----------
Equipment: **Manual**
Northing: ----------

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests ID No.	Observations / Comments
Hand Auger		0.0				Fill	**FILL**- Silty SAND, dark brown, trace rootlets.	sm	SM030625-28 0.05-0.20m	
		0.5				Natural	**Clayey SAND**- brown becoming pale brown mottled orange, fine to medium grained.	m	SM030625-29 0.40-0.50m SM030625-30 0.80-1.00m	
		1.0					**Hole Terminated at 1.00m** target depth reached			
		1.5								
		2.0								

Moisture

D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

Logged By: **Stephen McCormack** Date: **3/06/2025**
Checked By: **Stephen McCormack** Date: **12/06/2025**

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Borehole Log Report

Geo Environmental Engineering
Unit 2 / 5 - 7 Malta Street
Fairfield East NSW 2165
T 02 9420 3361

Hole ID. **BH212**
Hole Depth: **2.60 m**
Sheet: **1 of 2**

Project Name: **Site Contamination Investigation** Project Number: **E24016FOR**
Location / Site: **20 - 22 Melwood Avenue, Forestville NSW** Client: **Forestville RSL Club Ltd**

Drilling Company: **FICO Group** Date Started: **3/06/2025** Ground Level: ----------
Drill Method: **Solid Flight Auger** Date Completed: **3/06/2025** Easting: ----------
Equipment: **4WD Utility Rig** Northing: ----------

Method	Depth (m)	Material Description	Moisture	Samples / Tests ID No.	Observations / Comments
Solid Flight Auger		**ASPHALT**- 100mm.			
		FILL- Sandy GRAVEL, grey, fine to coarse sand and gravel (road base layer).	m	SM030625-66 0.10-0.30m	
	0.5	**Clayey SAND**- grey orange red, fine to medium grained.	m	SM030625-67 / 102 0.50-0.70m	
	1.0	becoming pale grey (ew-hw sandstone) from 1.0m.			
	1.5			SM030625-68 1.50-1.70m	
	2.0				

Fill / Natural

Moisture	
D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

Logged By: **Stephen McCormack** Date: **3/06/2025**
Checked By: **Stephen McCormack** Date: **12/06/2025**

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Borehole Log Report

Geo Environmental Engineering
Unit 2 / 5 - 7 Malta Street
Fairfield East NSW 2165
T 02 9420 3361

geo-environmental ENGINEERING

Hole ID. **BH212**
Hole Depth: **2.60 m**
Sheet: **2 of 2**

Project Name: **Site Contamination Investigation**
Project Number: **E24016FOR**
Location / Site: **20 - 22 Melwood Avenue, Forestville NSW**
Client: **Forestville RSL Club Ltd**

Drilling Company: **FICO Group**
Date Started: **3/06/2025**
Ground Level: ----------
Drill Method: **Solid Flight Auger**
Date Completed: **3/06/2025**
Easting: ----------
Equipment: **4WD Utility Rig**
Northing: ----------

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests ID No.	Observations / Comments
Solid Flight Auger		2.5				Natural	**Clayey SAND**- grey orange red, fine to medium grained.*(continued)*	m		
		3.0					**Refusal at 2.60m** on sandstone bedrock			
		3.5								
		4.0								

Moisture	
D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

Logged By: **Stephen McCormack** Date: **3/06/2025**
Checked By: **Stephen McCormack** Date: **12/06/2025**

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Borehole Log Report

Geo Environmental Engineering
Unit 2 / 5 - 7 Malta Street
Fairfield East NSW 2165
T 02 9420 3361

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Hole ID. **BH213**
Hole Depth: **0.50 m**
Sheet: **1 of 1**

Project Name: **Site Contamination Investigation**
Project Number: **E24016FOR**
Location / Site: **20 - 22 Melwood Avenue, Forestville NSW**
Client: **Forestville RSL Club Ltd**

Drilling Company: **FICO Group**
Date Started: **3/06/2025**
Ground Level: ----------
Drill Method: **Solid Flight Auger**
Date Completed: **3/06/2025**
Easting: ----------
Equipment: **4WD Utility Rig**
Northing: ----------

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Samples / Tests ID No.	Observations / Comments
Solid Flight Auger						Fill	**ASPHALT**- 100mm.		
						Natural	**FILL**- Gravelly SAND, brown and red, fine to coarse sand and gravel.	SM030625-59 0.10-0.30m	
		0.5					**Refusal at 0.50m** on sandstone bedrock		
		1.0							
		1.5							
		2.0							

Moisture	
D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

Logged By: **Stephen McCormack** Date: **3/06/2025**
Checked By: **Stephen McCormack** Date: **12/06/2025**

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Borehole Log Report

Geo Environmental Engineering
Unit 2 / 5 - 7 Malta Street
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Hole ID. **BH214**
Hole Depth: **0.90 m**
Sheet: **1 of 1**

Project Name: **Site Contamination Investigation**
Project Number: **E24016FOR**
Location / Site: **20 - 22 Melwood Avenue, Forestville NSW**
Client: **Forestville RSL Club Ltd**

Drilling Company: **FICO Group**
Date Started: **3/06/2025**
Ground Level: ----------
Drill Method: **Solid Flight Auger**
Date Completed: **3/06/2025**
Easting: ----------
Equipment: **4WD Utility Rig**
Northing: ----------

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Samples / Tests ID No.	Observations / Comments
Solid Flight Auger		0.5				Fill	**ASPHALT**- 100mm.		
							FILL- Sandy GRAVEL, trace brick.	SM030625-57 0.10-0.30m	
						Natural	**SAND**- red / orange grey, trace clay (EW sandstone).	SM030625-58 0.60-0.70m	
		1.0					**Refusal at 0.90m** on sandstone bedrock		
		1.5							
		2.0							

Moisture

D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

Logged By: **Stephen McCormack** Date: **3/06/2025**
Checked By: **Stephen McCormack** Date: **12/06/2025**

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Borehole Log Report

Geo Environmental Engineering
Unit 2 / 5 - 7 Malta Street
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T 02 9420 3361

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Hole ID. **BH215**
Hole Depth: **1.50 m**
Sheet: **1 of 1**

Project Name: **Site Contamination Investigation**
Project Number: **E24016FOR**
Location / Site: **20 - 22 Melwood Avenue, Forestville NSW**
Client: **Forestville RSL Club Ltd**

Drilling Company: **FICO Group**
Date Started: **3/06/2025**
Ground Level: ----------
Drill Method: **Solid Flight Auger**
Date Completed: **3/06/2025**
Easting: ----------
Equipment: **4WD Utility Rig**
Northing: ----------

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests ID No.	Observations / Comments
Solid Flight Auger		0.0				Fill	**ASPHALT**- 100mm.			
							FILL- Silty SAND, grey brown, fine to medium grained, trace gravel.	m	SM030625-52 0.10-0.30m	
		0.5								
		1.0				Natural	**Clayey SAND**- orange / red, fine to medium grained, (extremely weathered sandstone).	m	SM030625-53 0.70-0.90m	
		1.5							SM030625-54 1.30-1.50m	
							Refusal at 1.50m on sandstone bedrock			
		2.0								

Moisture	
D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

Logged By: **Stephen McCormack** Date: **3/06/2025**
Checked By: **Stephen McCormack** Date: **12/06/2025**

GEE DAVIES BH LOG E24016FOR.GPJ GEE.GDT 15/6/25 2:52:41 PM

Borehole Log Report

Geo Environmental Engineering
Unit 2 / 5 - 7 Malta Street
Fairfield East NSW 2165
T 02 9420 3361

geo-environmental ENGINEERING

Hole ID. **BH216**
Hole Depth: **1.00 m**
Sheet: **1 of 1**

Project Name: **Site Contamination Investigation**
Project Number: **E24016FOR**
Location / Site: **20 - 22 Melwood Avenue, Forestville NSW**
Client: **Forestville RSL Club Ltd**

Drilling Company: **FICO Group**
Date Started: **3/06/2025**
Ground Level: ----------
Drill Method: **Solid Flight Auger**
Date Completed: **3/06/2025**
Easting: ----------
Equipment: **4WD Utility Rig**
Northing: ----------

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests ID No.	Observations / Comments
Solid Flight Auger		0.5				Fill	**ASPHALT**- 100mm.			
							FILL- Gravelly SAND, grey brown, fine to coarse grained, with fine to coarse gravel.	m	SM030625-55 0.10-0.30m	
		1.0				Natural	**SAND**- fine to medium grained, with trace clay (extremely weathered sandstone).	m	SM030625-56 0.60-0.80m	
		1.5					**Refusal at 1.00m** on sandstone bedrock			
		2.0								

Moisture

D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

Logged By: **Stephen McCormack** Date: **3/06/2025**
Checked By: **Stephen McCormack** Date: **12/06/2025**

GEE DAVIES BH LOG E24016FOR.GPJ GEE.GDT 15/6/25 2:52:41 PM

Borehole Log Report

Geo Environmental Engineering
Unit 2 / 5 - 7 Malta Street
Fairfield East NSW 2165
T 02 9420 3361

geo-environmental ENGINEERING

Hole ID. **BH217**
Hole Depth: **1.10 m**
Sheet: **1 of 1**

Project Name: **Site Contamination Investigation**
Project Number: **E24016FOR**
Location / Site: **20 - 22 Melwood Avenue, Forestville NSW**
Client: **Forestville RSL Club Ltd**

Drilling Company: **FICO Group**
Date Started: **3/06/2025**
Ground Level: ----------
Drill Method: **Solid Flight Auger**
Date Completed: **3/06/2025**
Easting: ----------
Equipment: **4WD Utility Rig**
Northing: ----------

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests ID No.	Observations / Comments
Solid Flight Auger		0.5				Fill	**ASPHALT**- 100mm.			
						Natural	**Silty SAND**- pale brown, fine to medium grained.	m	SM030625-62 0.10-0.30m	
		1.0					**SAND**- with orange / red clay turning grey / red / orange with depth (EW sandstone).	m	SM030625-63 0.60-0.80m SM030625-64 0.90-1.00m	
		1.5					**Refusal at 1.10m** on sandstone bedrock			
		2.0								

Moisture

D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

Logged By: **Stephen McCormack** Date: **3/06/2025**
Checked By: **Stephen McCormack** Date: **12/06/2025**

GEE DAVIES BH LOG E24016FOR.GPJ GEE.GDT 15/6/25 2:52:41 PM

Borehole Log Report

Geo Environmental Engineering
Unit 2 / 5 - 7 Malta Street
Fairfield East NSW 2165
T 02 9420 3361

geo-environmental ENGINEERING

Hole ID. **BH218**
Hole Depth: **0.90 m**
Sheet: **1 of 1**

Project Name: **Site Contamination Investigation**
Project Number: **E24016FOR**
Location / Site: **20 - 22 Melwood Avenue, Forestville NSW**
Client: **Forestville RSL Club Ltd**

Drilling Company: **FICO Group**
Date Started: **3/06/2025**
Ground Level: ----------
Drill Method: **Solid Flight Auger**
Date Completed: **3/06/2025**
Easting: ----------
Equipment: **4WD Utility Rig**
Northing: ----------

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests ID No.	Observations / Comments
Solid Flight Auger		0.0				Fill	**ASPHALT**- 100mm.			
						Fill	**FILL**- Gravelly SAND, brown / grey.	m	SM030625-60 0.10-0.30m	
		0.5				Natural	**Clayey SAND**- grey / red / orange, (extremely weathered sandstone).	m	SM030625-61 / 101 0.50-0.60m	
		1.0					**Refusal at 0.90m** on sandstone bedrock			
		1.5								
		2.0								

Moisture

D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

Logged By: **Stephen McCormack** Date: **3/06/2025**
Checked By: **Stephen McCormack** Date: **12/06/2025**

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Borehole Log Report

Geo Environmental Engineering
Unit 2 / 5 - 7 Malta Street
Fairfield East NSW 2165
T 02 9420 3361

Hole ID. **BH219**
Hole Depth: **0.80 m**
Sheet: **1 of 1**

Project Name: **Site Contamination Investigation**
Project Number: **E24016FOR**
Location / Site: **20 - 22 Melwood Avenue, Forestville NSW**
Client: **Forestville RSL Club Ltd**

Drilling Company: **Geo Environmental Engineering**
Date Started: **3/06/2025**
Ground Level: ----------
Drill Method: **Hand Auger**
Date Completed: **3/06/2025**
Easting: ----------
Equipment: **Manual**
Northing: ----------

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests ID No.	Observations / Comments
Hand Auger		0.0				Fill	**TOPSOIL / FILL**- Silty SAND, dark brown, fine to medium grained, trace rootlets.	sm	SM030625-25 0.05-0.20m	
		0.5				Fill	**FILL**- SAND, brown, fine to medium grained.	m	SM030625-26 0.40-0.50m	
						Natural	**Clayey SAND**- light brown mottled red brown, fine to coarse grained, with trace gravel. becoming wet from 0.7m.	w	SM030625-27 0.70-0.80m	
		1.0					**Hole Terminated at 0.80m** target depth reached			
		1.5								
		2.0								

Moisture

D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

Logged By: **Sean Gao** Date: **3/06/2025**
Checked By: **Stephen McCormack** Date: **12/06/2025**

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Geo Environmental Engineering
82 Bridge Street
Lane Cove NSW 2066
E info@geoenvironmental.com.au

Log Report Legend

MATERIAL SYMBOL

FILL	CONCRETE	ASPHALT	TOPSOIL
ORGANICS	ESTUARINE MUD		

CLAY	SAND	SILT	GRAVEL
Sandy CLAY	Clayey SAND	Clayey SILT	Clayey GRAVEL
Silty CLAY	Silty SAND	Sandy SILT	Sandy GRAVEL
Gravelly CLAY	Gravelly SAND	Gravelly SILT	Silty GRAVEL
CLAY & SAND	SAND & CLAY	SILT & CLAY	GRAVEL & CLAY
CLAY & SILT	SAND & SILT	SILT & SAND	GRAVEL & SAND
CLAY & GRAVEL	SAND & GRAVEL	SILT & GRAVEL	GRAVEL & SILT
Sandy Silty CLAY	Clayey Silty SAND	Sandy Clayey SILT	Sandy Clayey GRAVEL
Silty Sandy CLAY	Silty Clayey SAND	Clayey Sandy SILT	Clayey Sandy GRAVEL
Sandy Gravelly CLAY	Clayey Gravelly SAND	Sandy Gravelly SILT	Silty Clayey GRAVEL
Silty Gravelly CLAY	Silty Gravelly SAND	Clayey Gravelly SILT	Clayey Silty GRAVEL
Gravelly Silty CLAY	Gravelly Silty SAND	Gravelly Clayey SILT	Sandy Silty GRAVEL
Gravelly Sandy CLAY	Gravelly Clayey SAND	Gravelly Sandy SILT	Silty Sandy GRAVEL

SANDSTONE	SHALE	GRANITE	BASALT	SHALE / SANDSTONE
PORCELLANITE	GNEISS	SHALE / CLAYSTONE	MUDSTONE	
CLAYSTONE	MUDSTONE / CLAYSTONE	SHALE / SILTSTONE	IRONSTONE	

WATER LEVELS

Encountered Water

Standing Water

ABBREVIATIONS

PT	Pushtube
SFA	Solid Flight Auger
PWS	Percussion Window Sampler
HA	Hand Auger
HFA	Hollow Flight Auger

WELL GRAPHICS

Cuttings	Bentonite	Screen
Gravel Pack	Grout	Cave-in

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APPENDIX E

QUALITY ASSURANCE ASSESSMENT REPORT

E1. INTRODUCTION

A detailed Quality Assurance (QA) assessment, including the analysis of Quality Control (QC) samples, was carried out by GEE to determine the reliability of field procedures and analytical results.

E2. QUALITY ASSURANCE

Quality Assurance (QA) involves all of the actions, procedures, checks and decisions undertaken to ensure the representativeness and integrity of samples and accuracy and reliability of analysis results (reference 1).

In accordance with AS4482.1 (reference 2), a series of QA procedures were integrated within the sampling and analysis plan and included:

- ◊ The collection of Quality Control (QC) samples.
- ◊ The use of standardised field sampling forms developed by GEE.
- ◊ Documentation of calibration and use of field instruments.

To ensure QA in the field, samples were collected by experienced and trained personnel using appropriate methods detailed herein, including appropriate sample handling, containment and transport, and calibrated equipment. Additionally, QC samples were collected and analysed as discussed in Section E3.

To ensure QA in the laboratory, GEE used laboratories that are NATA accredited for the analytical tests carried out, therefore it is reasonable for GEE to rely on the laboratories to be proficient in all tests conducted. This encompasses all actions, procedures, checks and decisions undertaken, to ensure the accuracy and reliability of the analysis results. As part of the laboratory QA, QC samples were analysed with each batch of samples as part of this investigation as required by NATA. A discussion of the laboratory QC samples analysed as part of this investigation is provided in Section E3.3.2.

E3. QUALITY CONTROL

QC involves those parts of QA which serve to monitor and measure the effectiveness of QA procedures. QC samples assess sample integrity, accuracy and precision and can be separated into field and laboratory QC.

E3.1 DEFINITIONS

Table E1 provides a description and objective of each of the field and laboratory QC samples used during this investigation.

Table E1: QC Sample Types, Descriptions and Recommended Frequency of Analysis

Type	Description	Purpose	Recommended Frequency
	FIELD QC SAMPLES		
Blind Replicate	A sample collected at the same time and from the same sampling point as the corresponding primary sample[1], and analysed at the same laboratory. Blind replicates are collected, preserved, stored, transported and analysed in the same manner as the primary sample, with the laboratory having no knowledge of the source of the replicate sample. The assessment of blind replicates samples is undertaken by calculating the Relative Percent Difference (RPD) which is defined as: $RPD\ (\%) = 100 \times \frac{\text{Result No. 1 – Result No. 2}}{\text{Mean Result}}$	Used to evaluate total sampling and analysis precision and, in the case of soil samples, sample variability.	In accordance with AS4482.1 (reference 2) and NEPM (reference 3) it is recommended that 1 blind replicate sample is collected for every 20 primary samples.
Split Duplicate	A sample collected at the same time and from the same sampling point as the corresponding primary sample, and analysed at a separate laboratory. Split duplicates are collected, preserved, stored, transported and analysed in the same manner as the primary sample, with the laboratories having no knowledge of the purpose of the sample. The assessment of split duplicates samples is undertaken by calculating the Relative Percent Difference (RPD) which is defined as: $RPD\ (\%) = 100 \times \frac{\text{Result No. 1 – Result No. 2}}{\text{Mean Result}}$	Used to provide a check on the analytical proficiency of the laboratories and hence precision and comparability.	In accordance with AS4482.1 (reference 2) and NEPM (reference 3) it is recommended that 1 split duplicate sample is collected for every 20 primary samples.

[1] Primary samples are the original representative samples of soil or groundwater collected for analysis to determine aspects of their chemical composition. Primary samples are the original sample taken from a particular location and other samples from the same location are duplicates, replicates or splits.

Table E1 Continued

Type	Description	Purpose	Recommended Frequency
Trip Blank	Trip blanks are laboratory supplied test samples of analyte-free media (either washed sand or de-ionised water) which remain in the sample storage eskies during sampling activities and returned to the laboratory unopened. For soil sampling programmes, the trip blank consists of acid-washed quartz sand that has been heated to 400ºC. For water sampling programs trip blanks comprise pre-washed glass vials containing distilled or de-ionised water with appropriate preservatives. The USEPA has shown that cross-contamination only occurs with volatile organics (reference 4), therefore, trip blanks are only analysed for volatile organics.	Used to measure cross-contamination during sampling, transport, sample preparation and analysis.	Industry standard is 1 trip blank per batch of primary samples.
Trip Spike	Trip spikes, like trip blanks, are supplied by the primary laboratory using analyte-free media (either washed sand or de-ionised water) and remain in the sample storage eskies during sampling activities and returned to the laboratory unopened. The sample media, however, is spiked with BTEX. For water sampling programmes the BTEX concentration is known and standardised by each laboratory, while for soil sampling programmes the exact spike concentration is not known, rather two identical jars of sand are spiked the same concentration with one sample becoming the trip-spike and the other becoming a control sample, which remains in a refrigerator at the laboratory. The trip spike is analysed after returning from the field and the % recovery of the known spike (for water sampling programs), or of the control sample (for soil sampling programs), is calculated.	Used to monitor VOC losses during transit.	Industry standard is 1 trip spike per batch of primary samples where volatile concentrations are being measured.
Rinsate	This is a sample of distilled or de-ionised water poured over the surface of a decontaminated piece of sampling equipment and collected in appropriate laboratory supplied sample containers. The sample is then analysed for contaminants of concern analysed as part of the investigation.	Provides an assessment of potential cross contamination of chemicals from sampling equipment caused by inadequate decontamination procedures.	In accordance with AS4482.1 – (reference 2) one rinsate sample should be collected each day per piece of sampling equipment and.



Table E1 Continued

Type	Description	Purpose	Recommended Frequency
	LABORATORY QC SAMPLES		
Laboratory Duplicate	Laboratory duplicates are field samples which are prepared and analysed in the same manner twice. The assessment of laboratory duplicates is undertaken by calculating the (RPD) which is defined as: $\text{RPD (\%)} = 100 \times \frac{\text{Result No. 1 – Result No. 2}}{\text{Mean Result}}$	Determines analytical precision for a sample batch	NATA specifies 1 per 10 samples for trace element and inorganic analysis
Laboratory Control Sample (LCS)	Laboratory Control Samples (LCS) are analyte-free matrices (de-ionised water or clean sand) spiked with a known concentration of target analytes and carried through the entire preparation and analysis. Assessment of LCS is undertaken by calculating the percent recovery (%R) of the spike which is defined as: $\text{Percent Recovery (\%R)} = 100 \times \frac{\text{Spikes Sample Result (SSR) – Sample Result (SR)}}{\text{Concentration of Spike Added (SA)}}$	Determines analytical accuracy and precision for a batch of samples	NATA specifies 1 per batch of up to 20 samples
Surrogates	Surrogates are organic compounds added to field samples and laboratory QC samples prior to preparation. They are similar in chemical behaviour to the target analytes and are not expected to be present in samples from part of the laboratory QC for organic analyses, and are used to indicate the presence of sample specific interferences. The surrogate is added at the extraction stage then analysed with the batch of samples. Like LCSs, surrogates are assessed by calculating the percent recovery (%R), although the definition is slightly different as shown below: $\text{Percent Recovery (\%R)} = 100 \times \frac{\text{Spiked Sample Result (SSR)}}{\text{Concentration of Spike Added (SA)}}$	Used to demonstrate that the surrogate does not interfere with the target analytes, therefore determines analytical accuracy for each sample	Added to every blank, field and laboratory QC sample
Matrix Spikes	Field samples spiked with a known concentration of a target analytes and carried through the entire preparation and analysis. Matrix spike samples are assessed by calculating the percent recovery (%R) of the spike which is defined as: $\text{Percent Recovery (\%R)} = 100 \times \frac{\text{Spikes Sample Result (SSR) – Sample Result (SR)}}{\text{Concentration of Spike Added (SA)}}$	Determine the effects of matrix interferences on analytical accuracy of a sample.	Performed at least 1 per batch of up to 20 samples.
Method Blank	Method blanks are an analyte-free matrices (reagent water or clean sand) that is carried through the entire preparation and analysis.	Establishes that laboratory contamination does not cause false positives.	Prepared with every batch of up to 20 samples for all organic and inorganic analyses.

E3.2 CRITERIA / ACCEPTABLE RANGE

The QC Acceptance Criteria adopted for this investigation is provided in Table E2 and is in general accordance with the Table 4 of AS4482.1 (reference 2) and NEPM (reference 3).

Table E2: QC Sample Acceptance Criteria

QC Sample	Criteria / Acceptable Range
FIELD QC SAMPLES	
Blind Replicate & Split Duplicate	RPD < 50 % When average concentration is > 10 x LOR/PQL[2] RPD < 75 % When average concentration is 5 to 10 x LOR/PQL RPD < 150 % When average concentration is < 5 x LOR/PQL
Trip Blank	Analytical Result < LOR/PQL
Trip Spike	± 30%
Rinsate	Analytical Result < LOR/PQL
LABORATORY QC SAMPLES	
Laboratory Duplicates	RPD < 30 % When average concentration is > 10 x LOR/PQL RPD < 50 % When average concentration is 4 to 10 x LOR/PQL RPD < 100 % When average concentration is< 4 x LOR/PQL
Laboratory Control Samples	%R of 70 – 130% (General analytes) %R of 50 – 130% (Phenols) %R of 60 – 130% (OCP/OPPs) %R of 62 – 130% (Chromium)
Surrogates	%R of 70 – 130% (General analytes) %R of 50 – 130% (Phenols) %R of 60 – 130% (OCP/OPPs)
Matrix Spikes	%R of 70 – 130% (General analytes) %R of 50 – 130% (Phenols) %R of 60 – 130% (OCP/OPPs) %R of 62 – 130% (Chromium)
Method Blanks	Analytical Results < LOR/PQL

If data do not meet the QC Acceptance Criteria, then a judgement is made as to whether the exceedance is critical in relation to the suitability of the data set. Otherwise, the following steps will be taken:

- ◊ Request that the laboratory re-check or even re-analyse the sample.
- ◊ Inspect the sample for anomalies which may be causing the failure.
- ◊ If necessary, undertake additional sampling and analyses.

[2] Both the LOR and PQL are interchangeable terms used by laboratories and is defined as the lowest concentration that can be reliably achieved within specific limits of precision and accuracy during routine laboratory operating conditions (reference 5).

E3.3 RESULTS

E3.3.1 Field QC Samples

Field QC samples collected and analysed as part of this investigation comprised:

- ◊ Three blind replicates (SM030625-100, SM030625-102, SM030625-104)
- ◊ Three split duplicates (SM030625-101, SM030625-103, SM030625-105)
- ◊ One trip blank per batch of samples (labelled 'trip blank')
- ◊ One trip spike per batch of samples (labelled 'trip spike)
- ◊ One Rinsate from the hand auger (SM030625-R)

Tabulated results are presented at the conclusion of this Appendix. Table E3 provides a summary of the frequency of QC samples and lists results which do not meet the criteria established in Table E2.

Table E3: QC Sample Acceptance Criteria - Soil

Type	Frequency Conducted	Results Not Meeting the Criteria
Blind Replicates	Metals - 3 per 42 samples (7.1%)	Zinc in 1 sample (RPD 74%) & Chromium in 1 sample (RPD 89%)
	TRH/BTEXN - 2 per 18 samples (11.1%)	--
	PAHs – 2 per 23 samples (8.7%)	--
	OCPs – 2 per 24 samples (8.3%)	--
	OPPs – 1 per 16 samples (6.3%)	--
	PCBs – 1 per 10 samples (10.0%)	--
Split Duplicate	Metals - 3 per 42 samples (7.1%)	Chromium in 1 sample (RPD 84%)
	TRH/BTEXN - 2 per 18 samples (11.1%)	--
	PAHs – 2 per 23 samples (8.7%)	--
	OCPs – 2 per 24 samples (8.3%)	--
	OPPs – 1 per 16 samples (6.3%)	--
	PCBs – 1 per 10 samples (10.0%)	--
Rinsate	Hand Auger	--
Trip Spike	1 per sample batch	--
Trip Blank	1 per sample batch	--

The soil program quality control results all conformed to the sample acceptance criteria except an elevated RPDs for some metals in one the blind replicates and split duplicates. The elevated RPDs is attributed to the heterogeneous nature of the

samples rather than an error with the lab's precision. Regardless, GEE has adopted to highest concentrations when assessing contamination risk and when making conclusions about the site.

E3.3.2 Laboratory QC

Laboratory QC results are provided in the laboratory reports while a summary of the results which exceeded the acceptance criteria is provided in Table E4.

Table E4: QC Sample Acceptance Criteria

Type	Results Exceeding Criteria
Laboratory Duplicates	--
Laboratory Control Samples	--
Surrogates	--
Matrix Spikes	--
Method Blanks	--

E4. DATA QUALITY ASSESSMENT

In accordance with reference 1, Data Quality Indicators (DQIs), specifically, precision, accuracy, representativeness, completeness and comparability, were used to assess the reliability of field procedures and analytical results.

E4.1 PRECISION

This is the measure of the variability (or reproducibility) of the data. In the field precision is achieved by using standard operating procedures which were adopted by GEE during this investigation. For laboratory analysis precision is assessed using blind replicates and trip spikes. The measured RPDs for the blind replicate samples and split samples were considered acceptable as were the analytical results for the trip spike.

E4.2 ACCURACY

Accuracy is a measure of the closeness of a measurement to the true parameter value. In the field, accuracy is achieved by using standard operating procedures which were adopted by GEE. For laboratory analysis, accuracy is assessed using tip blanks, rinsate blanks, method blanks, matrix spikes, surrogates and laboratory control samples. Considering that these QC samples were of an acceptable standard, GEE considers the laboratory data set to be accurate.

E4.3 REPRESENTATIVENESS

This is the confidence (expressed qualitatively) that the data are representative of each media present on the site. This is achieved in the field and laboratory by using an adequate number of sampling points to characterise the site and ensuring that the samples collected were representative of the media from which they were collected. Additionally, samples should be analysed within necessary holding times depending on the analyte.

Environmental samples were collected from each borehole in general accordance with techniques described in Australian Standards AS4482.1 (reference 2) AS4482.2 (reference 6) and NEPM (reference 1), to maintain the representativeness and integrity of the samples. The number of sampling points exceeded the minimum required sampling density as defined by NSW EPA (reference 7), however, were considered sufficient for the purpose of this investigation.

Finally, all samples were analysed within holding times.

E4.4 COMPLETENESS

This is a measure of whether all the data necessary to meet the project objectives, were collected. In the field and laboratory, this is achieved by sampling all critical locations and depths using acceptable methods and ensuring samples are analysed for appropriate chemicals.

GEE selected sufficient enough sample points for the purpose of the investigation as defined by the NSW EPA (reference 7). Additionally, samples were analysed for chemicals of concern based on appropriate field screening measures and logging of unusual aesthetics which may indicate contamination. Combined with the fact that standard operating procedures were adopted by GEE, the investigation is assessed as being complete.

E4.5 COMPARABILITY

This is a measure of confidence that data may be considered to be equivalent for each sampling and analysis event. Soil samples were collected by experienced GEE personnel using standard operating procedures and analysed in accordance with NATA accredited laboratory methods. The comparability of the data should be consistent as sampling protocols were employed throughout the duration of the fieldwork and analysis was undertaken by NATA registered laboratories using accredited analytical methods.

E5. CONCLUSION

A review of the DQIs indicates that the field procedures and analytical results adopted for this investigation are able to be relied upon for making conclusions and recommendations regarding the contamination status of the site.

References

1. *NEPC, 1999: National Environment Protection Council (1999). National Environment Protection (Assessment of Site Contamination) Measure, 1999. Schedule B(2) Site Characterisation.*

2. *Australian Standard AS4482.1 – 2005: Guide to the sampling and investigation of potentially contaminated soil Part 1: Non-volatile and semi-volatile compounds.*

3. *NEPC, 1999: National Environment Protection Council (1999). National Environment Protection (Assessment of Site Contamination) Measure. Schedule B(3) Guideline of Laboratory Analysis of Potentially contaminated Soils.*

4. *Keith, 1991: Environmental sampling and Analysis, A practical guide. Lewis Publishers.*

5. *Popek (2003). Sampling and Analysis of Environmental Chemical Pollutants. Academic Press.*

6. *Australian Standard AS4482.2 – 1999: Guide to the sampling and investigation of potentially contaminated soil Part 2: Volatile substances.*

7. *NSW EPA, 2022: Environment Protection Authority NSW, 2022: Contaminated Land Guidelines: Sampling Design – Part 1. August 2022.*

SOIL - Blind Replicate Results

			Sample Date	3/06/2025	3/06/2025	RPD	3/06/2025	3/06/2025	RPD	3/06/2025	3/06/2025	RPD
	Sample Identification			**SM030625-50**	**SM030625-100**		**SM030625-12**	**SM030625-104**		**SM030625-67**	**SM030625-102**	
Analyte	LOR	Units										
Total Metals												
Arsenic	4	mg/kg		21	30	35%	<4	<4	--	5	<4	**--**
Cadmium	0.4	mg/kg		<0.4	<0.4	--	<0.4	<0.4	--	<0.4	<0.4	--
Chromium	1	mg/kg		11	11	0%	<1	1	**--**	26	10	**89%**
Copper	1	mg/kg		5	8	46%	<1	<1	--	<1	<1	--
Lead	1	mg/kg		12	15	22%	<1	<1	**--**	24	17	34%
Mercury	0.1	mg/kg		<0.1	<0.1	--	<0.1	<0.1	--	<0.1	<0.1	--
Nickel	1	mg/kg		2	5	86%	<1	<1	**--**	<1	<1	--
Zinc	1	mg/kg		35	76	**74%**	6	6	0%	2	1	67%
BTEXN												
Benzene	0.2	mg/kg		<0.2	<0.2	--	-	-	--	<0.2	<0.2	--
Toluene	0.5	mg/kg		<0.5	<0.5	--	-	-	--	<0.5	<0.5	--
Ethylbenzene	1	mg/kg		<1	<1	--	-	-	--	<1	<1	--
Total Xylenes	1	mg/kg		<1	<1	--	-	-	--	<1	<1	--
Naphthalene	1	mg/kg		<1	<1	--	-	-	--	<1	<1	--
Total Petroleum Hydrocarbons												
F1 (C6-C10)	25	mg/kg		<25	<25	--	-	-	--	<25	<25	--
F2 (>C10-C16)	50	mg/kg		<50	<50	--	-	-	--	<50	<50	--
F3 (>C16-C34)	100	mg/kg		<100	<100	--	-	-	--	<100	<100	--
F4 (>C34-C40)	100	mg/kg		<100	<100	--	-	-	--	<100	<100	--
Polycyclic Aromatic Hydrocarbons												
Benzo(a)pyrene	0.05	mg/kg		<0.05	<0.05	--	-	-	--	<0.05	<0.05	--
Benzo(a)pyrene TEQ	0.5	mg/kg		<0.5	<0.5	--	-	-	--	<0.5	<0.5	--
Total PAHs	0.05	mg/kg		<0.05	<0.05	--	-	-	--	<0.05	<0.05	--
Organochlorine Pesticides (OCP)												
Heptachlor	0.1	mg/kg		<0.1	<0.1	--	<0.1	<0.1	--	-	-	--
Aldrin	0.1	mg/kg		<0.1	<0.1	--	<0.1	<0.1	--	-	-	--
Dieldrin	0.1	mg/kg		<0.1	<0.1	--	0.2	0.3	40%	-	-	--
Endrin	0.1	mg/kg		<0.1	<0.1	--	<0.1	<0.1	--	-	-	--
gamma-Chlordane	0.1	mg/kg		<0.1	<0.1	--	<0.1	<0.1	--	-	-	--
alpha-chlordane	0.1	mg/kg		<0.1	<0.1	--	<0.1	<0.1	--	-	-	--
Endosulfan I	0.1	mg/kg		<0.1	<0.1	--	<0.1	<0.1	--	-	-	--
Endosulfan II	0.1	mg/kg		<0.1	<0.1	--	<0.1	<0.1	--	-	-	--
HCB	0.1	mg/kg		<0.1	<0.1	--	<0.1	<0.1	--	-	-	--
Methoxychlor	0.1	mg/kg		<0.1	<0.1	--	<0.1	<0.1	--	-	-	--
DDE + DDD + DDT	0.1	mg/kg		<0.1	<0.1	--	<0.1	<0.1	--	-	-	--
Remaining OCPs	0.1	mg/kg		<0.1	<0.1	--	<0.1	<0.1	--	-	-	--
Organophosphate Pesticides (OPPs)												
Chlorpyriphos	0.1	mg/kg		-	-	--	<0.1	<0.1	--	-	-	--
Remaining OPPs	0.1	mg/kg		-	-	--	<0.1	<0.1	--	-	-	--
PCBs												
Total PCBs	0.1	mg/kg		<0.1	<0.1	--	-	-	--	-	-	--

Values in Bold Indicate:

RPD > 50 % When average concentration is > 10 x LOR
RPD > 75 % When average concentration is 5 to 10 x LOR
RPD > 150 % When average concentration is < 5 x LOR

SOIL - Split Duplicate Results

			Sample Date	3/06/2025	3/06/2025	RPD	3/06/2025	3/06/2025	RPD	3/06/2025	3/06/2025	RPD
	Sample Identification			**SM030625-69**	**SM030625-105**		**SM030625-08**	**SM030625-103**		**SM030625-61**	**SM030625-101**	
Analyte	LOR	Units										
Total Metals												
Arsenic	4	mg/kg		<4	<4	--	<4	<4	--	<4	<4	--
Cadmium	0.4	mg/kg		<0.4	<0.4	--	<0.4	<0.4	--	<0.4	<0.4	--
Chromium	1	mg/kg		13	32	**84%**	<1	1.2	--	11	15	31%
Copper	1	mg/kg		29	22	27%	<1	<1	--	2	1.5	29%
Lead	1	mg/kg		5	4.6	8%	2	1.2	50%	15	16	6%
Mercury	0.1	mg/kg		<0.1	<0.1	--	<0.1	<0.1	--	<0.1	<0.1	--
Nickel	1	mg/kg		12	21	**55%**	<1	<1	--	<1	<1	--
Zinc	1	mg/kg		21	24	13%	7	6.1	14%	2	1.5	29%
BTEXN												
Benzene	0.2	mg/kg		<0.2	<0.2	--	-	-	--	<0.2	<0.2	--
Toluene	0.5	mg/kg		<0.5	<0.5	--	-	-	--	<0.5	<0.5	--
Ethylbenzene	1	mg/kg		<1	<1	--	-	-	--	<1	<1	--
Total Xylenes	1	mg/kg		<1	<1	--	-	-	--	<1	<1	--
Naphthalene	1	mg/kg		<1	<1	--	-	-	--	<1	<1	--
Total Petroleum Hydrocarbons												
F1 (C6-C10)	25	mg/kg		<25	<25	--	-	-	--	<25	<25	--
F2 (>C10-C16)	50	mg/kg		<50	<50	--	-	-	--	<50	<50	--
F3 (>C16-C34)	100	mg/kg		<100	<100	--	-	-	--	<100	<100	--
F4 (>C34-C40)	100	mg/kg		<100	<100	--	-	-	--	<100	<100	--
Polycyclic Aromatic Hydrocarbons												
Benzo(a)pyrene	0.05	mg/kg		<0.05	<0.05	--	-	-	--	<0.05	<0.05	--
Benzo(a)pyrene TEQ	0.5	mg/kg		<0.5	<0.5	--	-	-	--	<0.5	<0.5	--
Total PAHs	0.05	mg/kg		<0.05	<0.05	--	-	-	--	<0.05	<0.05	--
Organochlorine Pesticides (OCP)												
Heptachlor	0.1	mg/kg		<0.1	<0.1	--	<0.1	<0.1	--	-	-	--
Aldrin	0.1	mg/kg		<0.1	<0.1	--	<0.1	<0.1	--	-	-	--
Dieldrin	0.1	mg/kg		<0.1	<0.1	--	0.3	0.31	3%	-	-	--
Endrin	0.1	mg/kg		<0.1	<0.1	--	<0.1	<0.1	--	-	-	--
gamma-Chlordane	0.1	mg/kg		<0.1	<0.1	--	<0.1	<0.1	--	-	-	--
alpha-chlordane	0.1	mg/kg		<0.1	<0.1	--	<0.1	<0.1	--	-	-	--
Endosulfan I	0.1	mg/kg		<0.1	<0.1	--	<0.1	<0.1	--	-	-	--
Endosulfan II	0.1	mg/kg		<0.1	<0.1	--	<0.1	<0.1	--	-	-	--
HCB	0.1	mg/kg		<0.1	<0.1	--	<0.1	<0.1	--	-	-	--
Methoxychlor	0.1	mg/kg		<0.1	<0.1	--	<0.1	<0.1	--	-	-	--
DDE + DDD + DDT	0.1	mg/kg		<0.1	<0.1	--	<0.1	<0.1	--	-	-	--
Remaining OCPs	0.1	mg/kg		<0.1	<0.1	--	<0.1	<0.1	--	-	-	--
Organophosphate Pesticides (OPPs)												
Chlorpyriphos	0.1	mg/kg		-	-	--	<0.1	<0.1	--	-	-	--
Remaining OPPs	0.1	mg/kg		-	-	--	<0.1	<0.1	--	-	-	--
PCBs												
Total PCBs	0.1	mg/kg		<0.1	<0.1	--	-	-	--	-	-	--

Values in Bold Indicate:

RPD > 50 % When average concentration is > 10 x LOR
RPD > 75 % When average concentration is 5 to 10 x LOR
RPD > 150 % When average concentration is < 5 x LOR

SOIL - Trip Blank Results

Laboratory:		Envirolab
Laboratory Report Number:		382376
Sample ID		**Trip Blank**
Analyte	Units	
BTEXN		
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
meta- & para-Xylene	mg/kg	<2
ortho-Xylene	mg/kg	<1
Total Xylenes	mg/kg	<3
Naphthalene	mg/kg	<1
Total Petroleum Hydrocarbons		
TRH C_6 - C_{10} (F1)	mg/kg	<25

Values in Bold Indicate: Detection above Laboratory Limit Of Reporting

SOIL - Trip Spike Results

Laboratory:		Envirolab
Laboratory Report Number:		382376
Sample ID		**Trip Spike**
Analyte	Units	
BTEXN		
Benzene	mg/kg	97
Toluene	mg/kg	97
Ethylbenzene	mg/kg	97
meta- & para-Xylene	mg/kg	98
ortho-Xylene	mg/kg	98
Total Xylenes	mg/kg	-
Naphthalene	mg/kg	-

Values in Bold Indicate: Data Outside Acceptable Range of 70 - 130

SOIL - Rinsate Results

Laboratory Report Number:		382376
Sample ID		**SM030625-R**
Analyte	Units	
Total Metals		
Arsenic	mg/L	<0.05
Cadmium	mg/L	<0.01
Chromium	mg/L	<0.01
Copper	mg/L	<0.01
Lead	mg/L	<0.03
Mercury	mg/L	<0.0005
Nickel	mg/L	<0.02
Zinc	mg/L	<0.02
BTEXN		
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Total Petroleum Hydrocarbons		
F1 (C6-C10)	µg/L	<10
F2 (>C10-C16)	µg/L	-
F3 (>C16-C34)	µg/L	-
F4 (>C34-C40)	µg/L	-

Values in Bold Indicate: Detection above Laboratory Limit Of Reporting

APPENDIX H

LABORATORY REPORTS

Envirolab Services Pty Ltd
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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 382376

Client Details

Client	Geo-Environmental Engineering
Attention	Stephen McCormack
Address	82 Bridge St, Lane Cove, NSW, 2066

Sample Details

Your Reference	**E24016FOR**
Number of Samples	54 Soil, 1 Water
Date samples received	03/06/2025
Date completed instructions received	03/06/2025

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	11/06/2025
Date of Issue	11/06/2025

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Asbestos Approved By
Analysed by Asbestos Approved Analyst: Nyovan Moonean
Authorised by Asbestos Approved Signatory: Nyovan Moonean

Results Approved By
Diego Bigolin, Inorganics Supervisor
Dragana Tomas, Senior Chemist
Giovanni Agosti, Group Technical Manager
Jack Wallis, Senior Chemist
Liam Timmins, Organics Supervisor
Nyovan Moonean, Asbestos Approved Identifier/Counter
Timothy Toll, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

VOCs in soil			
Our Reference		382376-1	382376-27
Your Reference	UNITS	SM030625-69	SM030625-18
Date Sampled		03/06/2025	03/06/2025
Type of sample		Soil	Soil
Date Extracted	-	05/06/2025	05/06/2025
Date Analysed	-	11/06/2025	11/06/2025
Dichlorodifluoromethane	mg/kg	<1	<1
Chloromethane	mg/kg	<1	<1
Vinyl Chloride	mg/kg	<1	<1
Bromomethane	mg/kg	<1	<1
Chloroethane	mg/kg	<1	<1
Trichlorofluoromethane	mg/kg	<1	<1
1,1-Dichloroethene	mg/kg	<1	<1
trans-1,2-Dichloroethene	mg/kg	<1	<1
1,1-Dichloroethane	mg/kg	<1	<1
cis-1,2-Dichloroethene	mg/kg	<1	<1
Bromochloromethane	mg/kg	<1	<1
Chloroform	mg/kg	<1	<1
2,2-Dichloropropane	mg/kg	<1	<1
1,2-Dichloroethane	mg/kg	<1	<1
1,1,1-Trichloroethane	mg/kg	<1	<1
1,1-Dichloropropene	mg/kg	<1	<1
Cyclohexane	mg/kg	<1	<1
Carbon Tetrachloride	mg/kg	<1	<1
Benzene	mg/kg	<0.2	<0.2
Dibromomethane	mg/kg	<1	<1
1,2-Dichloropropane	mg/kg	<1	<1
Trichloroethene	mg/kg	<1	<1
Bromodichloromethane	mg/kg	<1	<1
trans-1,3-Dichloropropene	mg/kg	<1	<1
cis-1,3-Dichloropropene	mg/kg	<1	<1
1,1,2-Trichloroethane	mg/kg	<1	<1
Toluene	mg/kg	<0.5	<0.5
1,3-Dichloropropane	mg/kg	<1	<1
Dibromochloromethane	mg/kg	<1	<1
1,2-Dibromoethane	mg/kg	<1	<1
Tetrachloroethene	mg/kg	<1	<1
1,1,1,2-Tetrachloroethane	mg/kg	<1	<1
Chlorobenzene	mg/kg	<1	<1
Ethylbenzene	mg/kg	<1	<1

VOCs in soil			
Our Reference	UNITS	382376-1	382376-27
Your Reference		SM030625-69	SM030625-18
Date Sampled		03/06/2025	03/06/2025
Type of sample		Soil	Soil
Bromoform	mg/kg	<1	<1
m+p-Xylene	mg/kg	<2	<2
Styrene	mg/kg	<1	<1
1,1,2,2-Tetrachloroethane	mg/kg	<1	<1
o-Xylene	mg/kg	<1	<1
1,2,3-Trichloropropane	mg/kg	<1	<1
Isopropylbenzene	mg/kg	<1	<1
Bromobenzene	mg/kg	<1	<1
n-Propylbenzene	mg/kg	<1	<1
2-Chlorotoluene	mg/kg	<1	<1
4-Chlorotoluene	mg/kg	<1	<1
1,3,5-Trimethylbenzene	mg/kg	<1	<1
tert-Butylbenzene	mg/kg	<1	<1
1,2,4-Trimethylbenzene	mg/kg	<1	<1
1,3-Dichlorobenzene	mg/kg	<1	<1
sec-Butylbenzene	mg/kg	<1	<1
1,4-Dichlorobenzene	mg/kg	<1	<1
4-Isopropyltoluene	mg/kg	<1	<1
1,2-Dichlorobenzene	mg/kg	<1	<1
n-Butylbenzene	mg/kg	<1	<1
1,2-Dibromo-3-chloropropane	mg/kg	<1	<1
1,2,4-Trichlorobenzene	mg/kg	<1	<1
Hexachlorobutadiene	mg/kg	<1	<1
1,2,3-Trichlorobenzene	mg/kg	<1	<1
Surrogate Dibromofluoromethane	%	94	99
Surrogate aaa-Trifluorotoluene	%	105	90
Surrogate Toluene-d_8	%	98	99
Surrogate 4-Bromofluorobenzene	%	106	105

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		382376-1	382376-2	382376-9	382376-16	382376-17
Your Reference	UNITS	SM030625-69	SM030625-50	SM030625-06	SM030625-13	SM030625-14
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	10/06/2025	10/06/2025	10/06/2025	10/06/2025	10/06/2025
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTRH 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	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	105	101	97	100	102

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		382376-20	382376-21	382376-27	382376-31	382376-32
Your Reference	UNITS	SM030625-17	SM030625-22	SM030625-18	SM030625-66	SM030625-67
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	10/06/2025	10/06/2025	10/06/2025	10/06/2025	10/06/2025
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTRH 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	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	101	92	90	102	97

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		382376-34	382376-35	382376-37	382376-40	382376-42
Your Reference	UNITS	SM030625-59	SM030625-57	SM030625-52	SM030625-55	SM030625-62
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	10/06/2025	10/06/2025	10/06/2025	10/06/2025	10/06/2025
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTRH 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	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	103	106	100	100	104

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		382376-43	382376-45	382376-46	382376-50	382376-51
Your Reference	UNITS	SM030625-63	SM030625-60	SM030625-61	SM030625-100	SM030625-102
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	10/06/2025	10/06/2025	10/06/2025	10/06/2025	10/06/2025
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTRH 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	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	73	79	77	73	74

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		382376-54	382376-55
Your Reference	UNITS	Trip Blank	Trip Spike
Date Sampled		03/06/2025	03/06/2025
Type of sample		Soil	Soil
Date extracted	-	05/06/2025	05/06/2025
Date analysed	-	10/06/2025	10/06/2025
TRH C_6 - C_9	mg/kg	<25	[NA]
TRH C_6 - C_{10}	mg/kg	<25	[NA]
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	[NA]
Benzene	mg/kg	<0.2	97%
Toluene	mg/kg	<0.5	97%
Ethylbenzene	mg/kg	<1	97%
m+p-xylene	mg/kg	<2	98%
o-Xylene	mg/kg	<1	98%
Naphthalene	mg/kg	<1	[NA]
Total +ve Xylenes	mg/kg	<1	[NA]
Surrogate aaa-Trifluorotoluene	%	78	98

svTRH (C10-C40) in Soil						
Our Reference		382376-1	382376-2	382376-9	382376-16	382376-17
Your Reference	UNITS	SM030625-69	SM030625-50	SM030625-06	SM030625-13	SM030625-14
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	200
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	200
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	<100	<100	<100	120
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	240
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	360
Surrogate o-Terphenyl	%	96	94	105	99	93

svTRH (C10-C40) in Soil						
Our Reference		382376-20	382376-21	382376-27	382376-31	382376-32
Your Reference	UNITS	SM030625-17	SM030625-22	SM030625-18	SM030625-66	SM030625-67
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	06/06/2025	06/06/2025	06/06/2025
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
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	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	93	95	95	93	92

svTRH (C10-C40) in Soil						
Our Reference		382376-34	382376-35	382376-37	382376-40	382376-42
Your Reference	UNITS	SM030625-59	SM030625-57	SM030625-52	SM030625-55	SM030625-62
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	06/06/2025	06/06/2025	06/06/2025
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
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	110	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	110	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	220	<50	<50	<50	<50
Surrogate o-Terphenyl	%	90	91	93	92	90

svTRH (C10-C40) in Soil						
Our Reference		382376-43	382376-45	382376-46	382376-50	382376-51
Your Reference	UNITS	SM030625-63	SM030625-60	SM030625-61	SM030625-100	SM030625-102
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	06/06/2025	06/06/2025	06/06/2025
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
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	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	90	88	90	89	90

PAHs in Soil						
Our Reference		382376-1	382376-2	382376-4	382376-9	382376-16
Your Reference	UNITS	SM030625-69	SM030625-50	SM030625-01	SM030625-06	SM030625-13
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	06/06/2025	06/06/2025	06/06/2025
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	115	104	106	104	117

PAHs in Soil						
Our Reference		382376-17	382376-20	382376-21	382376-24	382376-27
Your Reference	UNITS	SM030625-14	SM030625-17	SM030625-22	SM030625-19	SM030625-18
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	10/06/2025	10/06/2025	10/06/2025
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	115	131	138	131	131

PAHs in Soil						
Our Reference		382376-31	382376-32	382376-34	382376-35	382376-36
Your Reference	UNITS	SM030625-66	SM030625-67	SM030625-59	SM030625-57	SM030625-58
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	10/06/2025	10/06/2025	06/06/2025
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	0.4	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	139	131	123	138	133

PAHs in Soil						
Our Reference		382376-37	382376-38	382376-40	382376-41	382376-42
Your Reference	UNITS	SM030625-52	SM030625-53	SM030625-55	SM030625-56	SM030625-62
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	10/06/2025	06/06/2025	10/06/2025	06/06/2025	10/06/2025
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	132	129	128	113	129

PAHs in Soil						
Our Reference		382376-43	382376-45	382376-46	382376-50	382376-51
Your Reference	UNITS	SM030625-63	SM030625-60	SM030625-61	SM030625-100	SM030625-102
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	10/06/2025	10/06/2025	06/06/2025	10/06/2025	10/06/2025
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	124	126	109	117	113

Organochlorine Pesticides in soil						
Our Reference		382376-1	382376-2	382376-4	382376-6	382376-8
Your Reference	UNITS	SM030625-69	SM030625-50	SM030625-01	SM030625-03	SM030625-05
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	06/06/2025	06/06/2025	06/06/2025
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	0.3	0.6	<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
Mirex	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
Total Positive Aldrin+Dieldrin	mg/kg	<0.1	<0.1	0.3	0.6	<0.1
Surrogate 4-Chloro-3-NBTF	%	109	109	105	107	99

Organochlorine Pesticides in soil						
Our Reference		382376-9	382376-11	382376-12	382376-14	382376-15
Your Reference	UNITS	SM030625-06	SM030625-08	SM030625-09	SM030625-11	SM030625-12
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	06/06/2025	06/06/2025	06/06/2025
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	0.2	0.3	<0.1	<0.1	0.2
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
Mirex	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
Total Positive Aldrin+Dieldrin	mg/kg	0.2	0.3	<0.1	<0.1	0.2
Surrogate 4-Chloro-3-NBTF	%	109	106	105	107	103

Organochlorine Pesticides in soil						
Our Reference		382376-17	382376-18	382376-19	382376-21	382376-22
Your Reference	UNITS	SM030625-14	SM030625-15	SM030625-16	SM030625-22	SM030625-23
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	10/06/2025	10/06/2025	10/06/2025
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	0.5	<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
Mirex	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
Total Positive Aldrin+Dieldrin	mg/kg	<0.1	0.5	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	107	102	118	123	120

Organochlorine Pesticides in soil						
Our Reference		382376-24	382376-25	382376-27	382376-28	382376-34
Your Reference	UNITS	SM030625-19	SM030625-20	SM030625-18	SM030625-28	SM030625-59
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	10/06/2025	10/06/2025	10/06/2025	10/06/2025	10/06/2025
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	0.2	0.6	<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
Mirex	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
Total Positive Aldrin+Dieldrin	mg/kg	0.2	0.6	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	117	118	115	119	111

Organochlorine Pesticides in soil						
Our Reference		382376-35	382376-40	382376-45	382376-47	382376-50
Your Reference	UNITS	SM030625-57	SM030625-55	SM030625-60	SM030625-25	SM030625-100
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	10/06/2025	10/06/2025	10/06/2025	10/06/2025	10/06/2025
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	0.2	<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
Mirex	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
Total Positive Aldrin+Dieldrin	mg/kg	<0.1	<0.1	<0.1	0.2	<0.1
Surrogate 4-Chloro-3-NBTF	%	125	114	107	97	104

Organochlorine Pesticides in soil		
Our Reference		382376-52
Your Reference	UNITS	SM030625-104
Date Sampled		03/06/2025
Type of sample		Soil
Date extracted	-	05/06/2025
Date analysed	-	10/06/2025
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	0.3
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
Mirex	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Total Positive Aldrin+Dieldrin	mg/kg	0.3
Surrogate 4-Chloro-3-NBTF	%	88

Organophosphorus Pesticides in Soil						
Our Reference		382376-4	382376-6	382376-8	382376-11	382376-12
Your Reference	UNITS	SM030625-01	SM030625-03	SM030625-05	SM030625-08	SM030625-09
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	06/06/2025	06/06/2025	06/06/2025
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Mevinphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phorate	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
Disulfoton	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion-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
Fenthion	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
Methidathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenamiphos	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
Phosalone	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
Coumaphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	105	107	99	106	105

Organophosphorus Pesticides in Soil						
Our Reference		382376-14	382376-15	382376-18	382376-19	382376-22
Your Reference	UNITS	SM030625-11	SM030625-12	SM030625-15	SM030625-16	SM030625-23
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	06/06/2025	10/06/2025	10/06/2025
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Mevinphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phorate	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
Disulfoton	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion-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
Fenthion	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
Methidathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenamiphos	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
Phosalone	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
Coumaphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	107	103	102	118	120

Organophosphorus Pesticides in Soil						
Our Reference		382376-24	382376-25	382376-28	382376-47	382376-52
Your Reference	UNITS	SM030625-19	SM030625-20	SM030625-28	SM030625-25	SM030625-104
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	10/06/2025	10/06/2025	10/06/2025	10/06/2025	10/06/2025
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Mevinphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phorate	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
Disulfoton	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion-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
Fenthion	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
Methidathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenamiphos	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
Phosalone	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
Coumaphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	117	118	119	97	88

PCBs in Soil						
Our Reference		382376-1	382376-2	382376-9	382376-17	382376-21
Your Reference	UNITS	SM030625-69	SM030625-50	SM030625-06	SM030625-14	SM030625-22
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	06/06/2025	06/06/2025	10/06/2025
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 2-Fluorobiphenyl	%	110	107	106	110	123

PCBs in Soil						
Our Reference		382376-27	382376-34	382376-35	382376-40	382376-45
Your Reference	UNITS	SM030625-18	SM030625-59	SM030625-57	SM030625-55	SM030625-60
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	10/06/2025	10/06/2025	10/06/2025	10/06/2025	10/06/2025
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 2-Fluorobiphenyl	%	118	112	124	115	107

PCBs in Soil		
Our Reference		382376-50
Your Reference	UNITS	SM030625-100
Date Sampled		03/06/2025
Type of sample		Soil
Date extracted	-	05/06/2025
Date analysed	-	10/06/2025
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 2-Fluorobiphenyl	%	105

Misc Soil - Inorg			
Our Reference		382376-1	382376-27
Your Reference	UNITS	SM030625-69	SM030625-18
Date Sampled		03/06/2025	03/06/2025
Type of sample		Soil	Soil
Date prepared	-	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025
Total Phenolics (as Phenol)	mg/kg	<5	<5

Acid Extractable metals in soil						
Our Reference		382376-1	382376-2	382376-3	382376-4	382376-6
Your Reference	UNITS	SM030625-69	SM030625-50	SM030625-51	SM030625-01	SM030625-03
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	06/06/2025	06/06/2025	06/06/2025
Arsenic	mg/kg	<4	21	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	13	11	30	8	1
Copper	mg/kg	29	5	<1	7	<1
Lead	mg/kg	5	12	11	8	2
Mercury	mg/kg	<0.1	<0.1	<0.1	1.0	0.2
Nickel	mg/kg	12	2	1	4	<1
Zinc	mg/kg	21	35	<1	13	4

Acid Extractable metals in soil						
Our Reference		382376-7	382376-8	382376-9	382376-11	382376-12
Your Reference	UNITS	SM030625-04	SM030625-05	SM030625-06	SM030625-08	SM030625-09
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	06/06/2025	06/06/2025	06/06/2025
Arsenic	mg/kg	10	27	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	21	37	8	<1	5
Copper	mg/kg	1	<1	8	<1	1
Lead	mg/kg	12	7	7	2	8
Mercury	mg/kg	<0.1	0.1	0.9	<0.1	<0.1
Nickel	mg/kg	<1	2	4	<1	<1
Zinc	mg/kg	4	2	13	7	7

Acid Extractable metals in soil						
Our Reference		382376-13	382376-14	382376-15	382376-16	382376-17
Your Reference	UNITS	SM030625-10	SM030625-11	SM030625-12	SM030625-13	SM030625-14
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	06/06/2025	06/06/2025	06/06/2025
Arsenic	mg/kg	7	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	13	7	<1	10	6
Copper	mg/kg	<1	8	<1	<1	9
Lead	mg/kg	10	6	<1	9	5
Mercury	mg/kg	<0.1	0.5	<0.1	<0.1	0.1
Nickel	mg/kg	<1	4	<1	<1	3
Zinc	mg/kg	7	14	6	1	13

Acid Extractable metals in soil						
Our Reference		382376-18	382376-19	382376-20	382376-21	382376-22
Your Reference	UNITS	SM030625-15	SM030625-16	SM030625-17	SM030625-22	SM030625-23
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	06/06/2025	06/06/2025	06/06/2025
Arsenic	mg/kg	<4	6	<4	13	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	1	9	6	9	12
Copper	mg/kg	<1	1	<1	9	<1
Lead	mg/kg	1	16	3	16	4
Mercury	mg/kg	0.2	<0.1	<0.1	0.5	<0.1
Nickel	mg/kg	<1	<1	2	5	<1
Zinc	mg/kg	6	10	3	33	<1

Acid Extractable metals in soil						
Our Reference		382376-23	382376-24	382376-25	382376-26	382376-27
Your Reference	UNITS	SM030625-24	SM030625-19	SM030625-20	SM030625-21	SM030625-18
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	06/06/2025	06/06/2025	06/06/2025
Arsenic	mg/kg	<4	<4	<4	<4	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	10	8	1	12	16
Copper	mg/kg	<1	9	<1	<1	35
Lead	mg/kg	3	7	1	5	7
Mercury	mg/kg	<0.1	0.9	0.2	<0.1	0.2
Nickel	mg/kg	4	5	<1	<1	20
Zinc	mg/kg	1	20	6	<1	20

Acid Extractable metals in soil						
Our Reference		382376-28	382376-29	382376-31	382376-32	382376-34
Your Reference	UNITS	SM030625-28	SM030625-29	SM030625-66	SM030625-67	SM030625-59
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	06/06/2025	06/06/2025	06/06/2025
Arsenic	mg/kg	<4	<4	<4	5	13
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	6	11	78	26	39
Copper	mg/kg	8	<1	27	<1	5
Lead	mg/kg	13	10	6	24	11
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	4	1	76	<1	7
Zinc	mg/kg	31	<1	36	2	10

Acid Extractable metals in soil						
Our Reference		382376-35	382376-36	382376-37	382376-38	382376-40
Your Reference	UNITS	SM030625-57	SM030625-58	SM030625-52	SM030625-53	SM030625-55
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	06/06/2025	06/06/2025	06/06/2025
Arsenic	mg/kg	5	<4	<4	13	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	20	6	5	31	24
Copper	mg/kg	47	2	2	<1	53
Lead	mg/kg	7	10	8	15	5
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	59	1	1	<1	120
Zinc	mg/kg	27	1	8	<1	39

Acid Extractable metals in soil						
Our Reference		382376-41	382376-42	382376-43	382376-45	382376-46
Your Reference	UNITS	SM030625-56	SM030625-62	SM030625-63	SM030625-60	SM030625-61
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	06/06/2025	06/06/2025	06/06/2025
Arsenic	mg/kg	<4	<4	<4	6	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	15	6	7	14	11
Copper	mg/kg	2	1	<1	11	2
Lead	mg/kg	8	5	12	13	15
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	1	<1	<1	3	<1
Zinc	mg/kg	2	1	<1	12	2

Acid Extractable metals in soil						
Our Reference		382376-47	382376-48	382376-50	382376-51	382376-52
Your Reference	UNITS	SM030625-25	SM030625-26	SM030625-100	SM030625-102	SM030625-104
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	06/06/2025	06/06/2025	06/06/2025
Arsenic	mg/kg	<4	<4	30	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	7	2	11	10	1
Copper	mg/kg	7	<1	8	<1	<1
Lead	mg/kg	6	1	15	17	<1
Mercury	mg/kg	0.8	0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	4	<1	5	<1	<1
Zinc	mg/kg	12	6	76	1	6

Acid Extractable metals in soil		
Our Reference		382376-56
Your Reference	UNITS	SM030625-69 - [TRIPLICATE]
Date Sampled		03/06/2025
Type of sample		Soil
Date prepared	-	05/06/2025
Date analysed	-	06/06/2025
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	21
Copper	mg/kg	22
Lead	mg/kg	6
Mercury	mg/kg	<0.1
Nickel	mg/kg	22
Zinc	mg/kg	20

Moisture						
Our Reference		382376-1	382376-2	382376-3	382376-4	382376-6
Your Reference	UNITS	SM030625-69	SM030625-50	SM030625-51	SM030625-01	SM030625-03
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	06/06/2025	06/06/2025	06/06/2025
Moisture	%	18	9.4	13	11	7.1

Moisture						
Our Reference		382376-7	382376-8	382376-9	382376-11	382376-12
Your Reference	UNITS	SM030625-04	SM030625-05	SM030625-06	SM030625-08	SM030625-09
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	06/06/2025	06/06/2025	06/06/2025
Moisture	%	18	14	14	9.7	23

Moisture						
Our Reference		382376-13	382376-14	382376-15	382376-16	382376-17
Your Reference	UNITS	SM030625-10	SM030625-11	SM030625-12	SM030625-13	SM030625-14
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	06/06/2025	06/06/2025	06/06/2025
Moisture	%	19	13	17	16	12

Moisture						
Our Reference		382376-18	382376-19	382376-20	382376-21	382376-22
Your Reference	UNITS	SM030625-15	SM030625-16	SM030625-17	SM030625-22	SM030625-23
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	06/06/2025	06/06/2025	06/06/2025
Moisture	%	11	17	19	22	14

Moisture						
Our Reference		382376-23	382376-24	382376-25	382376-26	382376-27
Your Reference	UNITS	SM030625-24	SM030625-19	SM030625-20	SM030625-21	SM030625-18
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	06/06/2025	06/06/2025	06/06/2025
Moisture	%	11	14	11	15	16

Moisture						
Our Reference		382376-28	382376-29	382376-31	382376-32	382376-34
Your Reference	UNITS	SM030625-28	SM030625-29	SM030625-66	SM030625-67	SM030625-59
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	06/06/2025	06/06/2025	06/06/2025
Moisture	%	15	15	7.7	18	8.0

Moisture						
Our Reference		382376-35	382376-36	382376-37	382376-38	382376-40
Your Reference	UNITS	SM030625-57	SM030625-58	SM030625-52	SM030625-53	SM030625-55
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	06/06/2025	06/06/2025	06/06/2025
Moisture	%	9.3	11	14	17	11

Moisture						
Our Reference		382376-41	382376-42	382376-43	382376-45	382376-46
Your Reference	UNITS	SM030625-56	SM030625-62	SM030625-63	SM030625-60	SM030625-61
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	06/06/2025	06/06/2025	06/06/2025
Moisture	%	10	11	17	11	14

Moisture						
Our Reference		382376-47	382376-48	382376-50	382376-51	382376-52
Your Reference	UNITS	SM030625-25	SM030625-26	SM030625-100	SM030625-102	SM030625-104
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/06/2025	05/06/2025	05/06/2025	05/06/2025	05/06/2025
Date analysed	-	06/06/2025	06/06/2025	06/06/2025	06/06/2025	06/06/2025
Moisture	%	11	19	11	17	17

Asbestos ID - soils						
Our Reference		382376-1	382376-2	382376-4	382376-6	382376-9
Your Reference	UNITS	SM030625-69	SM030625-50	SM030625-01	SM030625-03	SM030625-06
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	10/06/2025	10/06/2025	10/06/2025	10/06/2025	10/06/2025
Sample mass tested	g	Approx. 25g	Approx. 30g	Approx. 30g	Approx. 30g	Approx. 25g
Sample Description	-	Grey coarse-grained soil & rocks	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	-	Nil	Nil	Nil	Nil	Nil
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference		382376-14	382376-17	382376-21	382376-24	382376-27
Your Reference	UNITS	SM030625-11	SM030625-14	SM030625-22	SM030625-19	SM030625-18
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	10/06/2025	10/06/2025	10/06/2025	10/06/2025	10/06/2025
Sample mass tested	g	Approx. 25g	Approx. 30g	Approx. 20g	Approx. 20g	Approx. 25g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Grey sandy 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	-	Nil	Nil	Nil	Nil	Nil
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference		382376-28	382376-31	382376-34	382376-35	382376-37
Your Reference	UNITS	SM030625-28	SM030625-66	SM030625-59	SM030625-57	SM030625-52
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	10/06/2025	10/06/2025	10/06/2025	10/06/2025	10/06/2025
Sample mass tested	g	Approx. 25g	Approx. 30g	Approx. 20g	Approx. 20g	34.78g
Sample Description	-	Brown coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Grey sandy 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	Chrysotile asbestos detected Amosite asbestos detected Crocidolite asbestos detected Organic fibres detected
Asbestos comments	-	Nil	Nil	Nil	Nil	YES
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils					
Our Reference		382376-40	382376-42	382376-45	382376-47
Your Reference	UNITS	SM030625-55	SM030625-62	SM030625-60	SM030625-25
Date Sampled		03/06/2025	03/06/2025	03/06/2025	03/06/2025
Type of sample		Soil	Soil	Soil	Soil
Date analysed	-	10/06/2025	10/06/2025	10/06/2025	10/06/2025
Sample mass tested	g	Approx. 30g	Approx. 30g	Approx. 25g	Approx. 30g
Sample Description	-	Grey coarse-grained soil & rocks	Beige clayey soil & rocks	Brown clayey 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
Asbestos comments	-	Nil	Nil	Nil	Nil
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

vTRH(C6-C10)/BTEXN in Water		
Our Reference	UNITS	382376-53
Your Reference		SM030625-R
Date Sampled		03/06/2025
Type of sample		Water
Date extracted	-	06/06/2025
Date analysed	-	10/06/2025
TRH C_6 - C_9	µg/L	<10
TRH C_6 - C_{10}	µg/L	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	102
Surrogate Toluene-d8	%	99
Surrogate 4-Bromofluorobenzene	%	95

svTRH (C10-C40) in Water		
Our Reference		382376-53
Your Reference	UNITS	SM030625-R
Date Sampled		03/06/2025
Type of sample		Water
Date extracted	-	05/06/2025
Date analysed	-	05/06/2025
TRH C_{10} - C_{14}	µg/L	<50
TRH C_{15} - C_{28}	µg/L	<100
TRH C_{29} - C_{36}	µg/L	<100
Total +ve TRH (C10-C36)	µg/L	<50
TRH >C_{10} - C_{16}	µg/L	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50
TRH >C_{16} - C_{34}	µg/L	<100
TRH >C_{34} - C_{40}	µg/L	<100
Total +ve TRH (>C10-C40)	µg/L	<50
Surrogate o-Terphenyl	%	115

Metals in Waters - Acid extractable		
Our Reference		382376-53
Your Reference	UNITS	SM030625-R
Date Sampled		03/06/2025
Type of sample		Water
Date prepared	-	05/06/2025
Date analysed	-	05/06/2025
Arsenic - Total	mg/L	<0.05
Cadmium - Total	mg/L	<0.01
Chromium - Total	mg/L	<0.01
Copper - Total	mg/L	<0.01
Lead - Total	mg/L	<0.03
Mercury - Total	mg/L	<0.0005
Nickel - Total	mg/L	<0.02
Zinc - Total	mg/L	<0.02

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-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. Total Phosphate determined stochiometrically from Phosphorus (assumed to be present as Phosphate). Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.
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-021/022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD and/or GC-MS/GC-MSMS. 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-022/025	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	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.
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-2	382376-27
Date Extracted	-			05/06/2025	1	05/06/2025	05/06/2025		05/06/2025	05/06/2025
Date Analysed	-			11/06/2025	1	11/06/2025	11/06/2025		11/06/2025	11/06/2025
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	127	95
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	134	107
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	117	91
1,1,1-Trichloroethane	mg/kg	1	Org-023	<1	1	<1	<1	0	113	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	125	96
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	124	95
Bromodichloromethane	mg/kg	1	Org-023	<1	1	<1	<1	0	114	86
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	119	91
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	105	80
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	124	96
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	125	96
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	122	95
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-2	382376-27
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	124	96
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-Propylbenzene	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-Trimethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
tert-Butylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-Trimethylbenzene	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-Butylbenzene	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-Isopropyltoluene	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-Butylbenzene	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 Dibromofluoromethane	%		Org-023	99	1	94	92	2	97	99
Surrogate aaa-Trifluorotoluene	%		Org-023	102	1	105	95	10	111	86
Surrogate Toluene-d_8	%		Org-023	98	1	98	97	1	102	103
Surrogate 4-Bromofluorobenzene	%		Org-023	105	1	106	105	1	107	108

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	382376-9
Date extracted	-			05/06/2025	1	05/06/2025	05/06/2025		05/06/2025	05/06/2025
Date analysed	-			10/06/2025	1	10/06/2025	10/06/2025		10/06/2025	10/06/2025
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	110	107
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	110	107
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	116	115
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	85	111
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	119	103
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	116	103
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	122	105
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	102	1	105	95	10	98	99

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	382376-27
Date extracted	-			[NT]	17	05/06/2025	05/06/2025		05/06/2025	05/06/2025
Date analysed	-			[NT]	17	10/06/2025	10/06/2025		10/06/2025	10/06/2025
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	17	<25	<25	0	123	95
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	17	<25	<25	0	123	95
Benzene	mg/kg	0.2	Org-023	[NT]	17	<0.2	<0.2	0	125	96
Toluene	mg/kg	0.5	Org-023	[NT]	17	<0.5	<0.5	0	119	91
Ethylbenzene	mg/kg	1	Org-023	[NT]	17	<1	<1	0	125	96
m+p-xylene	mg/kg	2	Org-023	[NT]	17	<2	<2	0	122	95
o-Xylene	mg/kg	1	Org-023	[NT]	17	<1	<1	0	124	96
Naphthalene	mg/kg	1	Org-023	[NT]	17	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	17	102	99	3	111	86

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]	40	05/06/2025	05/06/2025		[NT]	[NT]
Date analysed	-			[NT]	40	10/06/2025	10/06/2025		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	40	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	40	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	40	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	40	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	40	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	40	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	40	<1	<1	0	[NT]	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	40	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	40	100	112	11	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	382376-9
Date extracted	-			05/06/2025	1	05/06/2025	05/06/2025		05/06/2025	05/06/2025
Date analysed	-			06/06/2025	1	05/06/2025	05/06/2025		05/06/2025	05/06/2025
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	98	93
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	87	85
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	129	100
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	98	93
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	<100	<100	0	87	85
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	129	100
Surrogate o-Terphenyl	%		Org-020	93	1	96	95	1	81	83

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	382376-27
Date extracted	-			[NT]	17	05/06/2025	05/06/2025		05/06/2025	05/06/2025
Date analysed	-			[NT]	17	05/06/2025	05/06/2025		06/06/2025	06/06/2025
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	17	<50	<50	0	107	92
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	17	<100	110	10	94	82
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	17	200	170	16	100	93
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	17	<50	<50	0	107	92
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	17	120	140	15	94	82
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	17	240	200	18	100	93
Surrogate o-Terphenyl	%		Org-020	[NT]	17	93	94	1	88	83

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	40	05/06/2025	05/06/2025		[NT]	[NT]
Date analysed	-			[NT]	40	06/06/2025	06/06/2025		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	40	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	40	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	40	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	40	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	40	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	40	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	40	92	91	1	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	382376-9
Date extracted	-			05/06/2025	1	05/06/2025	05/06/2025		05/06/2025	05/06/2025
Date analysed	-			06/06/2025	1	06/06/2025	06/06/2025		06/06/2025	06/06/2025
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	80	88
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	74	78
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	80	84
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	82	88
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	78	84
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	84	86
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	76	80
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	<0.05	<0.05	0	80	82
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	128	1	115	107	7	88	99

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	382376-27
Date extracted	-			[NT]	4	05/06/2025	05/06/2025		05/06/2025	05/06/2025
Date analysed	-			[NT]	4	06/06/2025	06/06/2025		10/06/2025	10/06/2025
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	96	98
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	72	70
Fluorene	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	94	94
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	100	102
Anthracene	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	102	102
Pyrene	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	106	108
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	90	88
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	4	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	4	<0.05	<0.05	0	90	88
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	4	106	112	6	104	107

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	17	05/06/2025	05/06/2025		[NT]	[NT]
Date analysed	-			[NT]	17	06/06/2025	06/06/2025		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	17	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	17	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	17	115	101	13	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	40	05/06/2025	05/06/2025		[NT]	[NT]
Date analysed	-			[NT]	40	10/06/2025	10/06/2025		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	40	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	40	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	40	128	137	7	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	382376-9
Date extracted	-			05/06/2025	1	05/06/2025	05/06/2025		05/06/2025	05/06/2025
Date analysed	-			06/06/2025	1	06/06/2025	06/06/2025		06/06/2025	06/06/2025
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	90
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	82	88
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	66	70
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	86	92
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	98
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	80	84
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	95
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	78	80
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	88	94
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	66	72
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	112	1	109	107	2	90	93

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	382376-14
Date extracted	-			[NT]	4	05/06/2025	05/06/2025		05/06/2025	05/06/2025
Date analysed	-			[NT]	4	06/06/2025	06/06/2025		10/06/2025	06/06/2025
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	100	88
HCB	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	96	84
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	92	66
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	110	88
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	110	94
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	96	82
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	4	0.3	0.3	0	108	94
Endrin	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	100	80
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	86	90
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	98	68
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	[NT]	4	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	[NT]	4	105	107	2	106	92

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	382376-27
Date extracted	-			[NT]	17	05/06/2025	05/06/2025		[NT]	05/06/2025
Date analysed	-			[NT]	17	06/06/2025	06/06/2025		[NT]	10/06/2025
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	96
HCB	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	96
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	92
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	114
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	116
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	98
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	114
Endrin	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	96
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	92
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	120
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	[NT]	17	107	105	2	[NT]	105

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	05/06/2025	05/06/2025		[NT]	[NT]
Date analysed	-			[NT]	22	10/06/2025	10/06/2025		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	[NT]	22	120	116	3	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	40	05/06/2025	05/06/2025		[NT]	[NT]
Date analysed	-			[NT]	40	10/06/2025	10/06/2025		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	[NT]	40	114	117	3	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	382376-14
Date extracted	-			05/06/2025	4	05/06/2025	05/06/2025		05/06/2025	05/06/2025
Date analysed	-			06/06/2025	4	06/06/2025	06/06/2025		06/06/2025	06/06/2025
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	88	88
Mevinphos	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Parathion-Methyl	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	82	84
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	72	74
Malathion	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	84	86
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	84	88
Fenthion	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	66	66
Bromophos-ethyl	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	82	86
Phosalone	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	112	4	105	107	2	90	92

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			[NT]	22	05/06/2025	05/06/2025		05/06/2025	[NT]
Date analysed	-			[NT]	22	10/06/2025	10/06/2025		10/06/2025	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	104	[NT]
Mevinphos	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Parathion-Methyl	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	102	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	92	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	110	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	106	[NT]
Fenthion	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	82	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	92	[NT]
Phosalone	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	[NT]	22	120	116	3	106	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	382376-9
Date extracted	-			05/06/2025	1	05/06/2025	05/06/2025		05/06/2025	05/06/2025
Date analysed	-			06/06/2025	1	06/06/2025	06/06/2025		06/06/2025	06/06/2025
Aroclor 1016	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	96	80
Aroclor 1260	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate 2-Fluorobiphenyl	%		Org-021/022/025	114	1	110	107	3	87	93

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	382376-27
Date extracted	-			[NT]	17	05/06/2025	05/06/2025		05/06/2025	05/06/2025
Date analysed	-			[NT]	17	06/06/2025	06/06/2025		10/06/2025	10/06/2025
Aroclor 1016	mg/kg	0.1	Org-021/022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021/022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021/022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021/022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021/022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021/022/025	[NT]	17	<0.1	<0.1	0	112	80
Aroclor 1260	mg/kg	0.1	Org-021/022/025	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Surrogate 2-Fluorobiphenyl	%		Org-021/022/025	[NT]	17	110	107	3	103	105

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	40	05/06/2025	05/06/2025		[NT]	[NT]
Date analysed	-			[NT]	40	10/06/2025	10/06/2025		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-021/022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021/022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021/022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021/022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021/022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021/022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-021/022/025	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Surrogate 2-Fluorobiphenyl	%		Org-021/022/025	[NT]	40	115	118	3	[NT]	[NT]

QUALITY CONTROL: Misc Soil - Inorg					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			05/06/2025	[NT]	[NT]	[NT]	[NT]	05/06/2025	[NT]
Date analysed	-			06/06/2025	[NT]	[NT]	[NT]	[NT]	06/06/2025	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	[NT]	[NT]	[NT]	[NT]	98	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	382376-9
Date prepared	-			05/06/2025	1	05/06/2025	05/06/2025		05/06/2025	05/06/2025
Date analysed	-			06/06/2025	1	06/06/2025	06/06/2025		06/06/2025	06/06/2025
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	108	101
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	96	91
Chromium	mg/kg	1	Metals-020	<1	1	13	21	47	100	96
Copper	mg/kg	1	Metals-020	<1	1	29	25	15	103	101
Lead	mg/kg	1	Metals-020	<1	1	5	6	18	95	91
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	81	96
Nickel	mg/kg	1	Metals-020	<1	1	12	19	45	99	96
Zinc	mg/kg	1	Metals-020	<1	1	21	24	13	89	84

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	382376-14
Date prepared	-			[NT]	3	05/06/2025	05/06/2025		05/06/2025	05/06/2025
Date analysed	-			[NT]	3	06/06/2025	06/06/2025		06/06/2025	06/06/2025
Arsenic	mg/kg	4	Metals-020	[NT]	3	<4	<4	0	115	97
Cadmium	mg/kg	0.4	Metals-020	[NT]	3	<0.4	<0.4	0	111	88
Chromium	mg/kg	1	Metals-020	[NT]	3	30	22	31	105	92
Copper	mg/kg	1	Metals-020	[NT]	3	<1	<1	0	93	97
Lead	mg/kg	1	Metals-020	[NT]	3	11	13	17	106	87
Mercury	mg/kg	0.1	Metals-021	[NT]	3	<0.1	<0.1	0	127	77
Nickel	mg/kg	1	Metals-020	[NT]	3	1	<1	0	107	92
Zinc	mg/kg	1	Metals-020	[NT]	3	<1	<1	0	106	80

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	382376-27
Date prepared	-			[NT]	17	05/06/2025	05/06/2025		05/06/2025	05/06/2025
Date analysed	-			[NT]	17	06/06/2025	06/06/2025		06/06/2025	06/06/2025
Arsenic	mg/kg	4	Metals-020	[NT]	17	<4	<4	0	100	95
Cadmium	mg/kg	0.4	Metals-020	[NT]	17	<0.4	<0.4	0	89	78
Chromium	mg/kg	1	Metals-020	[NT]	17	6	6	0	92	93
Copper	mg/kg	1	Metals-020	[NT]	17	9	10	11	95	87
Lead	mg/kg	1	Metals-020	[NT]	17	5	6	18	88	81
Mercury	mg/kg	0.1	Metals-021	[NT]	17	0.1	0.1	0	108	115
Nickel	mg/kg	1	Metals-020	[NT]	17	3	3	0	92	79
Zinc	mg/kg	1	Metals-020	[NT]	17	13	14	7	82	70

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	22	05/06/2025	05/06/2025		[NT]	[NT]
Date analysed	-			[NT]	22	06/06/2025	06/06/2025		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	22	<4	<4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	22	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	22	12	13	8	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	22	<1	<1	0	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	22	4	5	22	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	22	<1	<1	0	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	22	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	40	05/06/2025	05/06/2025		[NT]	[NT]
Date analysed	-			[NT]	40	06/06/2025	06/06/2025		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	40	<4	<4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	40	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	40	24	19	23	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	40	53	61	14	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	40	5	6	18	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	40	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	40	120	120	0	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	40	39	35	11	[NT]	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date extracted	-			06/06/2025	[NT]	[NT]	[NT]	[NT]	06/06/2025	[NT]
Date analysed	-			10/06/2025	[NT]	[NT]	[NT]	[NT]	10/06/2025	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	108	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	108	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	111	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	107	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	98	[NT]	[NT]	[NT]	[NT]	96	[NT]
Surrogate Toluene-d8	%		Org-023	98	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	92	[NT]	[NT]	[NT]	[NT]	99	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			05/06/2025	[NT]	[NT]	[NT]	[NT]	05/06/2025	[NT]
Date analysed	-			05/06/2025	[NT]	[NT]	[NT]	[NT]	05/06/2025	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	88	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	94	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	114	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	88	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	94	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	114	[NT]
Surrogate o-Terphenyl	%		Org-020	93	[NT]	[NT]	[NT]	[NT]	112	[NT]

QUALITY CONTROL: Metals in Waters - Acid extractable						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			05/06/2025	[NT]	[NT]	[NT]	[NT]	05/06/2025	[NT]
Date analysed	-			05/06/2025	[NT]	[NT]	[NT]	[NT]	05/06/2025	[NT]
Arsenic - Total	mg/L	0.05	Metals-020	<0.05	[NT]	[NT]	[NT]	[NT]	103	[NT]
Cadmium - Total	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	98	[NT]
Chromium - Total	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	97	[NT]
Copper - Total	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	102	[NT]
Lead - Total	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	100	[NT]
Mercury - Total	mg/L	0.0005	Metals-021	<0.0005	[NT]	[NT]	[NT]	[NT]	93	[NT]
Nickel - Total	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	102	[NT]
Zinc - Total	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	96	[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.

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.

Air volumes are typically provided by customers (often as flow rate(s) and sampling time(s) and/or simply volumes) sampled or exposure times (determines 'volume' passive badges are exposed to)). Hence in such circumstances the volume measurement is inevitably not covered by Envirolab's NATA accreditation. An exception may occur where Envirolab Newcastle does the sampling where accreditation exists for certain types of sampling and hence volume determination(s). Note air volumes are often used to determine concentrations for dust and/or analyses on filters, sorbents and in impingers. For canister sampling, the air volume is covered by Envirolab's NATA accreditation.

Urine Analysis - The BEI values listed are taken from the 2022 edition of "TLVs and BEIs Threshold Limits" by ACGIH.

Report Comments

Acid Extractable Metals in Soil:
- The laboratory RPD acceptance criteria has been exceeded for 382376-1 for Cr & Ni. Therefore a triplicate result has been issued as laboratory sample number 382376-56.

Asbestos: A portion of the supplied sample was sub-sampled for asbestos according to ASB-001 asbestos subsampling procedure. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab/MPL recommends supplying 40-60g or 500ml of sample in its own container.
Note: Samples requested for testing were sub-sampled from jars provided by the client.

Sample 382376-37 ; Chrysotile, Amosite & Crocidolite asbestos identified in matted material, it is estimated to be 1.37g/kg in 34.78g of soil (i.e. > reporting limit for the method of 0.1g/kg).

COC 3/6/25, 1835

CHAIN OF CUSTODY - Client

ENVIROLAB SERVICES

Client:	Geo-Environmental Engineering Pty Ltd	**Client Project Name and Number:**	**Envirolab Services**
Project Mgr:	Stephen McCormack	E24016FOR	12 Ashley St, Chatswood, NSW, 2067
Sampler:	Stephen Mccormack	**PO No.:**	Phone: 02 9910 6200
Address:	Unit 2, 5-7 Malta Street, Fairfield East	**Envirolab Services Quote No. :**	Fax: 02 9910 6201
Email:	stephen@geoenvironmental.com.au	**Date results required:**	E-mail: sydney@envirolab.com.au
		Or choose: standard / 1 day / 2 day / 3 day / 5 day **4 days if possible**	
Phone:	0431 480 980 (Stephen)	*Note: Inform lab in advance if urgent turnaround is required - surcharge applies*	

Sample information				Tests Required														Comments
Envirolab Sample ID	Client Sample ID	Date sampled	Type of sample	Combination 3	Combination 3a	Combination 5	Combination 5a	PAHs	Metals (S8)	OCP/OPPs	Asbestos ID	VOCs	Combination 7a	TRH (vol)/BTEXN	BTEXN	Combo 1m			Provide as much information about the sample as you can
1	SM030625-69	3/06/2025	Soil									1	1						
2	SM030625-50	3/06/2025	Soil				1												
3	SM030625-51	3/06/2025	Soil						1										
4	SM030625-01	3/06/2025	Soil					1	1	1	1								
5	SM030625-02	3/06/2025	Soil																
6	SM030625-03	3/06/2025	Soil						1	1	1								
7	SM030625-04	3/06/2025	Soil						1										
8	SM030625-05	3/06/2025	Soil						1	1									
9	SM030625-06	3/06/2025	Soil				1												
10	SM030625-07	3/06/2025	Soil																
11	SM030625-08	3/06/2025	Soil						1	1									
12	SM030625-09	3/06/2025	Soil						1	1									
13	SM030625-10	3/06/2025	Soil						1										
14	SM030625-11	3/06/2025	Soil						1	1	1								
15	SM030625-12	3/06/2025	Soil						1	1									
16	SM030625-13	3/06/2025	Soil	1															

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

ENVIROLAB

Job No: 382376
Date Received: 3/6/25
Time Received: 1630
Received By: DL
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Relinquished by (company):	Geo-Environmental Engineering	**Received by (company):**	ES SYD
Print Name:	Stephen McCormack	**Print Name:**	Pallavun Lee
Date & Time:	03-Jun-25	**Date & Time:**	3/6/25 1630
Signature:		**Signature:**	

Samples Received: Cool or Ambient (circle one)
Temperature Recieved at: 2 (if applicable)
Transported by: Hand delivered / courier

CHAIN OF CUSTODY - Client

ENVIROLAB SERVICES

Client:	Geo-Environmental Engineering Pty Ltd	**Client Project Name and Number:**	**Envirolab Services**
Project Mgr:	Stephen McCormack	E24016FOR	12 Ashley St, Chatswood, NSW, 2067
Sampler:	Stephen Mccormack	**PO No.:**	Phone: 02 9910 6200
Address:	Unit 2, 5-7 Malta Street, Fairfield East	**Envirolab Services Quote No. :**	Fax: 02 9910 6201
Email:	stephen@geoenvironmental.com.au	**Date results required:** Or choose: standard / 1 day / 2 day / 3 day / 5 day	E-mail: sydney@envirolab.com.au
Phone:	0431 480 980 (Stephen)	*Note: Inform lab in advance if urgent turnaround is required - surcharge applies*	

Sample information				Tests Required													Comments
Envirolab Sample ID	Client Sample ID	Date sampled	Type of sample	Combinatiion 3	Combination 3a	Combination 5	Combination 5a	PAHs	Metals (S8)	OCP/OPPs	Asbestos ID	VOCs	Combination 7a	TRH (vol)/BTEXN	BTEXN	Combo 1m			Provide as much information about the sample as you can
17	SM030625-14	3/06/2025	Soil				1												
18	SM030625-15	3/06/2025	Soil						1	1									
19	SM030625-16	3/06/2025	Soil						1	1									
20	SM030625-17	3/06/2025	Soil	1															
21	SM030625-22	3/06/2025	Soil				1												
22	SM030625-23	3/06/2025	Soil						1	1									
23	SM030625-24	3/06/2025	Soil						1										
24	SM030625-19	3/06/2025	Soil					1	1	1	1								
25	SM030625-20	3/06/2025	Soil						1	1									
26	SM030625-21	3/06/2025	Soil						1										
27	SM030625-18	3/06/2025	Soil									1	1						
28	SM030625-28	3/06/2025	Soil						1	1	1								
29	SM030625-29	3/06/2025	Soil						1										
30	SM030625-30	3/06/2025	Soil																
31	SM030625-66	3/06/2025	Soil		1														
32	SM030625-67	3/06/2025	Soil	1															
33	SM030625-68	3/06/2025	Soil																

Relinquished by (company):	Geo-Environmental Engineering	**Received by (company):**	ALS
Print Name:	Stephen McCormack	**Print Name:**	PA Hwun Lee
Date & Time:	03-Jun-25	**Date & Time:**	3/6/25 16:30
Signature:		**Signature:**	

Samples Received: Cool or Ambient (circle one)
Temperature Recieved at: 2 (if applicable)
Transported by: Hand delivered / courier
~~#382376~~ 02
#382376

CHAIN OF CUSTODY - Client

ENVIROLAB SERVICES

Client:	Geo-Environmental Engineering Pty Ltd	**Client Project Name and Number:**	**Envirolab Services**
Project Mgr:	Stephen McCormack	E24016FOR	12 Ashley St, Chatswood, NSW, 2067
Sampler:	Stephen Mccormack	**PO No.:**	Phone: 02 9910 6200
Address:	Unit 2, 5-7 Malta Street, Fairfield East	**Envirolab Services Quote No. :**	Fax: 02 9910 6201
Email:	stephen@geoenvironmental.com.au	**Date results required:** Or choose: standard / 1 day / 2 day / 3 day / 5 day	E-mail: sydney@envirolab.com.au
Phone:	0431 480 980 (Stephen)	*Note: Inform lab in advance if urgent turnaround is required - surcharge applies*	

Sample information				Tests Required														Comments
Envirolab Sample ID	Client Sample ID	Date sampled	Type of sample	Combinatiion 3	Combination 3a	Combination 5	Combination 5a	PAHs	Metals (S8)	OCP/OPPs	Asbestos ID	VOCs	Combination 7a	TRH (vol)/BTEXN	BTEXN	Combo 1m			Provide as much information about the sample as you can
34	SM030625-59	3/06/2025	Soil				1												
35	SM030625-57	3/06/2025	Soil				1												
36	SM030625-58	3/06/2025	Soil					1	1										
37	SM030625-52	3/06/2025	Soil		1														
38	SM030625-53	3/06/2025	Soil					1	1										
39	SM030625-54	3/06/2025	Soil																
40	SM030625-55	3/06/2025	Soil				1												
41	SM030625-56	3/06/2025	Soil					1	1										
42	SM030625-62	3/06/2025	Soil		1														
43	SM030625-63	3/06/2025	Soil	1															
44	SM030625-64	3/06/2025	Soil																
45	SM030625-60	3/06/2025	Soil				1												
46	SM030625-61	3/06/2025	Soil	1															
47	SM030625-25	3/06/2025	Soil						1	1	1								
48	SM030625-26	3/06/2025	Soil						1										
49	SM030625-27	3/06/2025	Soil																

Relinquished by (company):	Geo-Environmental Engineering	**Received by (company):**	EWSMD
Print Name:	Stephen McCormack	**Print Name:**	Da Hyun Lee
Date & Time:	03-Jun-25	**Date & Time:**	3/6/25, 1650
Signature:		**Signature:**	

Samples Received: Cool or Ambient (circle one)
Temperature Recieved at: 2 (if applicable)
Transported by: Hand delivered / courier
#382376

CHAIN OF CUSTODY - Client

ENVIROLAB SERVICES

Client:	Geo-Environmental Engineering Pty Ltd	**Client Project Name and Number:** E24016FOR	**Envirolab Services** 12 Ashley St, Chatswood, NSW, 2067 Phone: 02 9910 6200 Fax: 02 9910 6201 E-mail: sydney@envirolab.com.au
Project Mgr:	Stephen McCormack		
Sampler:	Stephen Mccormack	**PO No.:**	
Address:	Unit 2, 5-7 Malta Street, Fairfield East	**Envirolab Services Quote No. :**	
Email:	stephen@geoenvironmental.com.au	**Date results required:** Or choose: standard / 1 day / 2 day / 3 day / 5 day	
Phone:	0431 480 980 (Stephen)	*Note: Inform lab in advance if urgent turnaround is required - surcharge applies*	

Sample information				Tests Required														Comments
Envirolab Sample ID	Client Sample ID	Date sampled	Type of sample	Combinatiion 3	Combination 3a	Combination 5	Combination 5a	PAHs	Metals (S8)	OCP/OPPs	Asbestos ID	VOCs	Combination 7a	TRH (vol)/BTEXN	BTEXN	Combo 1m			Provide as much information about the sample as you can
50	SM030625-100	3/06/2025	Soil			1												
51	SM030625-102	3/06/2025	Soil	1														
52	SM030625-104	3/06/2025	Soil						1	1								
53	SM030625-R	3/06/2025	water													1		
54	Trip Blank	3/06/2025	Soil											1				
55	Trip Spike	3/06/2025	Soil												1			

Relinquished by (company):	Geo-Environmental Engineering	**Received by (company):**	ES (VI)
Print Name:	Stephen McCormack	**Print Name:**	Da Hyun Lee
Date & Time:	03-Jun-25	**Date & Time:**	3/6/25. 1630
Signature:		**Signature:**	

Samples Received: Cool or Ambient (circle one)
Temperature Recieved at: 2 (if applicable)
Transported by: Hand delivered / courier
382376

#382376
3/6/25

CHAIN OF CUSTODY - Client

ENVIROLAB SERVICES

Client:	Geo-Environmental Engineering Pty Ltd	**Client Project Name and Number:**	**Envirolab Services**
Project Mgr:	Stephen McCormack	E24016FOR	5 Research Dr, Croydon South VIC 3136
Sampler:	Stephen Mccormack	**PO No.:**	Phone: 03 9763 2500
Address:	Unit 2, 5-7 Malta Street, Fairfield East	**Envirolab Services Quote No. :**	
Email:	stephen@geoenvironmental.com.au	**Date results required:**	E-mail: melbourne@envirolab.com.au
		Or choose: standard / 1 day / 2 day / 3 day / 5 day **4 days if possible**	
Phone:	0431 480 980 (Stephen)	*Note: Inform lab in advance if urgent turnaround is required - surcharge applies*	

Sample information				Tests Required															Comments
Envirolab Sample ID	**Client Sample ID**	**Date sampled**	**Type of sample**	**Combination 3**	**Combination 3a**	**Combination 5**	**Combination 5a**	**PAHs**	**Metals (S8)**	**OCP/OPPs**				**TRH (vol)/BTEXN**	**BTEXN**	**Combo 1m**		**Hold**	**Provide as much information about the sample as you can**
	SM030625-105	3/06/2025	Soil			1													
	SM030625-101	3/06/2025	Soil	1															
	SM030625-103	3/06/2025	Soil						1	1									

Relinquished by (company):	Geo-Environmental Engineering	**Received by (company):**	**Samples Received: Cool or Ambient (circle one)**
Print Name:	Stephen McCormack	**Print Name:**	**Temperature Recieved at:** **(if applicable)**
Date & Time:	03-Jun-25	**Date & Time:**	**Transported by: Hand delivered / courier**
Signature:		**Signature:**	**Page No: 1 of 1**

Envirolab Services Pty Ltd
ABN 37 112 535 645 - 002
25 Research Drive Croydon South VIC 3136
ph +61 3 9763 2500
melbourne@envirolab.com.au
www.envirolab.com.au

Certificate of Analysis MGF0098

Client Details

Client	Geo-Environmental Engineering Pty Ltd
Contact	Stephen McCormack
Address	82 Bridge Street, LANE COVE, NSW, 2066

Sample Details

Your Reference	E24016FOR
Number of Samples	3 Soil
Date Samples Received	05/06/2025
Date Instructions Received	05/06/2025

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 soils and on an as received basis for other matrices.

Report Details

Date Final Results Expected	12/06/2025
Date of Issue	11/06/2025

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Accredited for compliance with ISO/IEC 17025. Tests not covered by NATA are denoted with *.

Authorisation Details

Results Approved By	Chris De Luca, Lab Manager Maggie Hu, Organics Supervisor Tara White, Metals Supervisor
Laboratory Manager	Chris De Luca

Certificate of Analysis MGF0098

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
MGF0098-01	SM030625-105	Soil	03/06/2025	05/06/2025
MGF0098-02	SM030625-101	Soil	03/06/2025	05/06/2025
MGF0098-03	SM030625-103	Soil	03/06/2025	05/06/2025

Volatile TRH and BTEX (Soil)

Envirolab ID	Units	PQL	MGF0098-01	MGF0098-02
Your Reference			SM030625-105	SM030625-101
Date Sampled			03/06/2025	03/06/2025
TRH C6-C9	mg/kg	25	<25	<25
TRH C6-C10	mg/kg	25	<25	<25
TRH C6-C10 less BTEX (F1)	mg/kg	25	<25	<25
Methyl tert butyl ether (MTBE)	mg/kg	0.50	<0.50	<0.50
Benzene	mg/kg	0.20	<0.20	<0.20
Toluene	mg/kg	0.50	<0.50	<0.50
Ethylbenzene	mg/kg	1.0	<1.0	<1.0
meta+para Xylene	mg/kg	2.0	<2.0	<2.0
ortho-Xylene	mg/kg	1.0	<1.0	<1.0
Total +ve Xylenes	mg/kg	1.0	<1.0	<1.0
Naphthalene (value used in F2 calc)	mg/kg	1.0	<1.0	<1.0
Total +ve BTEX	mg/kg	0.20	<0.20	<0.20
Surrogate aaa-Trifluorotoluene	%		*70.7*	*74.8*

Semi-volatile TRH (Soil)

Envirolab ID	Units	PQL	MGF0098-01	MGF0098-02
Your Reference			SM030625-105	SM030625-101
Date Sampled			03/06/2025	03/06/2025
TRH C10-C14	mg/kg	50	<50	<50
TRH C15-C28	mg/kg	100	<100	<100
TRH C29-C36	mg/kg	100	<100	<100
Total +ve TRH C10-C36	mg/kg	50	<50	<50
TRH >C10-C16	mg/kg	50	<50	<50
TRH >C10-C16 less Naphthalene F2	mg/kg	50	<50	<50
TRH >C16-C34 (F3)	mg/kg	100	<100	<100
TRH >C34-C40 (F4)	mg/kg	100	<100	<100
Total +ve TRH >C10-C40	mg/kg	50	<50	<50
Surrogate o-Terphenyl	%		*73.9*	*74.0*

Polycyclic Aromatic Hydrocarbons (Soil)

Envirolab ID	Units	PQL	MGF0098-01	MGF0098-02
Your Reference			SM030625-105	SM030625-101
Date Sampled			03/06/2025	03/06/2025
Naphthalene	mg/kg	0.10	<0.10	<0.10
Acenaphthylene	mg/kg	0.10	<0.10	<0.10
Acenaphthene	mg/kg	0.10	<0.10	<0.10
Fluorene	mg/kg	0.10	<0.10	<0.10
Phenanthrene	mg/kg	0.10	<0.10	<0.10
Anthracene	mg/kg	0.10	<0.10	<0.10
Fluoranthene	mg/kg	0.10	<0.10	<0.10
Pyrene	mg/kg	0.10	<0.10	<0.10
Benzo(a)anthracene	mg/kg	0.10	<0.10	<0.10
Chrysene	mg/kg	0.10	<0.10	<0.10
Benzo(b,j,k)fluoranthene	mg/kg	0.20	<0.20	<0.20
Benzo(a)pyrene	mg/kg	0.050	<0.050	<0.050
Indeno(1,2,3-c,d)pyrene	mg/kg	0.10	<0.10	<0.10
Dibenzo(a,h)anthracene	mg/kg	0.10	<0.10	<0.10
Benzo(g,h,i)perylene	mg/kg	0.10	<0.10	<0.10
Total +ve PAH	mg/kg	0.050	<0.050	<0.050
Benzo(a)pyrene TEQ calc zero	mg/kg	0.50	<0.50	<0.50
Benzo(a)pyrene TEQ calc Half	mg/kg	0.50	<0.50	<0.50
Benzo(a)pyrene TEQ calc PQL	mg/kg	0.50	<0.50	<0.50
Surrogate p-Terphenyl-D14	%		*105*	*104*

Organochlorine Pesticides (Soil)

Envirolab ID	Units	PQL	MGF0098-01	MGF0098-03
Your Reference			SM030625-105	SM030625-103
Date Sampled			03/06/2025	03/06/2025
alpha-BHC	mg/kg	0.10	<0.10	<0.10
Hexachlorobenzene	mg/kg	0.10	<0.10	<0.10
beta-BHC	mg/kg	0.10	<0.10	<0.10
gamma-BHC	mg/kg	0.10	<0.10	<0.10
delta-BHC	mg/kg	0.10	<0.10	<0.10
Heptachlor	mg/kg	0.10	<0.10	<0.10
Aldrin	mg/kg	0.10	<0.10	<0.10
Heptachlor epoxide	mg/kg	0.10	<0.10	<0.10
trans-Chlordane	mg/kg	0.10	<0.10	<0.10
cis-Chlordane	mg/kg	0.10	<0.10	<0.10
Endosulfan I	mg/kg	0.10	<0.10	<0.10
4,4'-DDE	mg/kg	0.10	<0.10	<0.10
Dieldrin	mg/kg	0.10	<0.10	0.31
Endrin	mg/kg	0.10	<0.10	<0.10
4,4'-DDD	mg/kg	0.10	<0.10	<0.10
Endosulfan II	mg/kg	0.10	<0.10	<0.10
Endrin aldehyde	mg/kg	0.10	<0.10	<0.10
4,4'-DDT	mg/kg	0.10	<0.10	<0.10
Endosulfan sulfate	mg/kg	0.10	<0.10	<0.10
Endrin ketone	mg/kg	0.10	<0.10	<0.10
Methoxychlor	mg/kg	0.10	<0.10	<0.10
Mirex	mg/kg	0.10	<0.10	<0.10
Total +ve DDT+DDD+DDE	mg/kg	0.10	<0.10	<0.10
Total +ve Aldrin + Dieldrin	mg/kg	0.10	<0.10	0.31
Total +ve OCP	mg/kg	0.10	<0.10	0.31
Surrogate 4-chloro-3-nitrobenzotrifluoride	%		*109*	*109*

Organophosphorus Pesticides (Soil)

Envirolab ID	Units	PQL	MGF0098-03
Your Reference			SM030625-103
Date Sampled			03/06/2025
Dichlorvos	mg/kg	0.10	<0.10
Dimethoate	mg/kg	0.10	<0.10
Diazinon	mg/kg	0.10	<0.10
Chlorpyrifos-methyl	mg/kg	0.10	<0.10
Ronnel	mg/kg	0.10	<0.10
Fenitrothion	mg/kg	0.10	<0.10
Malathion	mg/kg	0.10	<0.10
Chlorpyrifos	mg/kg	0.10	<0.10
Parathion	mg/kg	0.10	<0.10
Bromophos-ethyl	mg/kg	0.10	<0.10
Ethion	mg/kg	0.10	<0.10
Coumaphos	mg/kg	0.10	<0.10
Disulfoton	mg/kg	0.10	<0.10
Fenamiphos	mg/kg	0.10	<0.10
Fenthion	mg/kg	0.10	<0.10
Methidathion	mg/kg	0.10	<0.10
Mevinphos	mg/kg	0.10	<0.10
Parathion-methyl	mg/kg	0.10	<0.10
Phorate	mg/kg	0.10	<0.10
Phosalone	mg/kg	0.10	<0.10
Azinphos-methyl	mg/kg	0.10	<0.10
Surrogate 4-chloro-3-nitrobenzotrifluoride	%		*109*

Polychlorinated Biphenyls (Soil)

Envirolab ID	Units	PQL	MGF0098-01
Your Reference			SM030625-105
Date Sampled			03/06/2025
Aroclor 1016	mg/kg	0.10	<0.10
Aroclor 1221	mg/kg	0.10	<0.10
Aroclor 1232	mg/kg	0.10	<0.10
Aroclor 1242	mg/kg	0.10	<0.10
Aroclor 1248	mg/kg	0.10	<0.10
Aroclor 1254	mg/kg	0.10	<0.10
Aroclor 1260	mg/kg	0.10	<0.10
Total +ve PCB (1016-1260)	mg/kg	0.10	<0.10
Surrogate 2-Fluorobiphenyl	%		*102*

Certificate of Analysis MGF0098

Acid Extractable Metals (Soil)

Envirolab ID	Units	PQL	MGF0098-01	MGF0098-02	MGF0098-03
Your Reference			SM030625-105	SM030625-101	SM030625-103
Date Sampled			03/06/2025	03/06/2025	03/06/2025
Arsenic	mg/kg	4.0	<4.0	<4.0	<4.0
Cadmium	mg/kg	0.40	<0.40	<0.40	<0.40
Chromium	mg/kg	1.0	32	15	1.2
Copper	mg/kg	1.0	22	1.5	<1.0
Mercury	mg/kg	0.10	<0.10	<0.10	<0.10
Nickel	mg/kg	1.0	21	<1.0	<1.0
Lead	mg/kg	1.0	4.6	16	1.2
Zinc	mg/kg	1.0	24	1.5	6.1

Certificate of Analysis MGF0098

Inorganics - Moisture (Soil)

Envirolab ID	Units	PQL	MGF0098-01	MGF0098-02	MGF0098-03
Your Reference			SM030625-105	SM030625-101	SM030625-103
Date Sampled			03/06/2025	03/06/2025	03/06/2025
Moisture	%	0.10	14	12	9.6

Method Summary

Method ID	Methodology Summary
INORG-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
METALS-020	Determination of various metals by ICP-OES. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.
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. 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-021/022/025_PCB	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD and/or GC-MS/GC-MSMS.
ORG-022	Determination of semi-volatile organic compounds (SVOCs) by GC-MS. Water samples are extracted by LLE and soils using DCM/Acetone/Methanol.
ORG-022_OC	Determination of semi-volatile organic compounds (SVOCs) by GC-MS. Water samples are extracted by LLE and soils using DCM/Acetone/Methanol.
ORG-022_PAH	Determination of semi-volatile organic compounds (SVOCs) by GC-MS. Water samples are extracted by LLE and solids using DCM/Acetone/Methanol. For PAHs:- Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. 1. 'TEQ 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. 'TEQ 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. 'TEQ 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, for Total +ve calculations, the PQL is reflective of the lowest individual PQL and therefore, for example, "Total +ve PAHs" is simply a sum of the positive individual PAHs.
ORG-023_F1_TOT	Determination of volatile organic compounds (VOCs) by P&T-GC-MS. Water samples are analysed directly by purge and trap GC-MS. Solids are extracted with Methanol, diluted and analysed 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 therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, and is determined by processing solvents and reagents in exactly the same manner as for samples.

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.

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.

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.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

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.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

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 QAQC tables for details (available on request); <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; 60-140% for organics (+/-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 typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

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. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

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 or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volumes are typically provided by customers (often as flow rate(s) and sampling time(s) and/or simply volume(s) sampled or exposure times (determines 'volume' passive badges are exposed to)). Hence in such circumstances the volume measurement is inevitably not covered by Envirolab's NATA accreditation. An exception may occur where Envirolab Newcastle does the sampling where accreditation exists for certain types of sampling and hence volume determination(s). Note air volumes are often used to determine concentrations for dust and/or analyses on filters, sorbents and in impingers. For canister sampling, the air volume is covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary MGF0098

Client Details

Client	Geo-Environmental Engineering Pty Ltd
Your Reference	E24016FOR
Date Issued	11/06/2025

Recommended Holding Time Compliance

No recommended holding time exceedances

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	Yes	No Outliers
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	Yes	No Outliers

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary MGF0098

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
vTRH&MBTEXN | Soil	1-2	03/06/2025	10/06/2025	10/06/2025	Yes
sTRH | Soil	1-2	03/06/2025	10/06/2025	10/06/2025	Yes
PAH | Soil	1-2	03/06/2025	10/06/2025	10/06/2025	Yes
OCP | Soil	1, 3	03/06/2025	10/06/2025	10/06/2025	Yes
OPP (21 list) | Soil	3	03/06/2025	10/06/2025	10/06/2025	Yes
PCB | Soil	1	03/06/2025	10/06/2025	10/06/2025	Yes
Metals | Soil	1-3	03/06/2025	10/06/2025	10/06/2025	Yes
Metals-Hg | Soil	1-3	03/06/2025	10/06/2025	10/06/2025	Yes
Moisture | Soil	1-3	03/06/2025	10/06/2025	11/06/2025	Yes

Quality Control MGF0098

ORG-023_F1_TOT|Volatile TRH and BTEX (Soil) | Batch BGF1278

Analyte	Units	PQL	Blank	DUP1 BGF1278-DUP1# Samp | QC | RPD %	DUP2 BGF1278-DUP2# Samp | QC | RPD %	LCS %	Spike % MGF0098-02
TRH C6-C9	mg/kg	25	<25	<25 | <25 | [NA]	<25 | <25 | [NA]	114	94.8
TRH C6-C10	mg/kg	25	<25	<25 | <25 | [NA]	<25 | <25 | [NA]	114	95.2
Methyl tert butyl ether (MTBE)	mg/kg	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	[NA]	[NA]
Benzene	mg/kg	0.20	<0.20	<0.20 | <0.20 | [NA]	<0.20 | <0.20 | [NA]	101	82.7
Toluene	mg/kg	0.50	<0.50	<0.50 | <0.50 | [NA]	<0.50 | <0.50 | [NA]	104	88.7
Ethylbenzene	mg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	93.5	79.6
meta+para Xylene	mg/kg	2.0	<2.0	<2.0 | <2.0 | [NA]	<2.0 | <2.0 | [NA]	97.1	82.8
ortho-Xylene	mg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	95.6	80.6
Naphthalene (value used in F2 calc)	mg/kg	1.0	<1.0	<1.0 | <1.0 | [NA]	<1.0 | <1.0 | [NA]	[NA]	[NA]
Surrogate aaa-Trifluorotoluene	*%*		*71.8*	*76.8 | 74.2*	*92.0 | 80.8*	*98.4*	*89.0*

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

ORG-020|Semi-volatile TRH (Soil) | Batch BGF1279

Analyte	Units	PQL	Blank	DUP1 BGF1279-DUP1# Samp | QC | RPD %	DUP2 BGF1279-DUP2# Samp | QC | RPD %	LCS %	Spike % MGF0098-02
TRH C10-C14	mg/kg	50	<50	<50 | <50 | [NA]		102	105
TRH C15-C28	mg/kg	100	<100	<100 | <100 | [NA]		85.0	88.0
TRH C29-C36	mg/kg	100	<100	<100 | <100 | [NA]		95.7	89.5
TRH >C10-C16	mg/kg	50	<50	<50 | <50 | [NA]		80.4	82.7
TRH >C16-C34 (F3)	mg/kg	100	<100	<100 | <100 | [NA]		87.3	90.1
TRH >C34-C40 (F4)	mg/kg	100	<100	<100 | <100 | [NA]		91.8	88.2
Surrogate o-Terphenyl	*%*		*73.6*	*73.9 | 75.4*		*88.3*	*87.7*

Analyte	Units	PQL	Blank	DUP3 BGF1279-DUP3# Samp | QC | RPD %	DUP4 BGF1279-DUP4# Samp | QC | RPD %	LCS %
TRH C10-C14	mg/kg	50		<50 | <50 | [NA]		[NA]
TRH C15-C28	mg/kg	100		<100 | <100 | [NA]		[NA]
TRH C29-C36	mg/kg	100		<100 | <100 | [NA]		[NA]
TRH >C10-C16	mg/kg	50		<50 | <50 | [NA]		[NA]
TRH >C16-C34 (F3)	mg/kg	100		<100 | 104 | [NA]		[NA]
TRH >C34-C40 (F4)	mg/kg	100		<100 | <100 | [NA]		[NA]
Surrogate o-Terphenyl	*%*			*78.9 | 79.2*		*[NA]*

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control MGF0098

ORG-022_PAH | Polycyclic Aromatic Hydrocarbons (Soil) | Batch BGF1279

Analyte	Units	PQL	Blank	DUP1 BGF1279-DUP1# Samp | QC | RPD %	DUP2 BGF1279-DUP2# Samp | QC | RPD %	LCS %	Spike % MGF0098-02
Naphthalene	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		102	114
Acenaphthylene	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Acenaphthene	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		107	115
Fluorene	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		104	112
Phenanthrene	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		105	112
Anthracene	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Fluoranthene	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		107	115
Pyrene	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		110	118
Benzo(a)anthracene	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Chrysene	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		106	114
Benzo(b,j,k)fluoranthene	mg/kg	0.20	<0.20	<0.20 | <0.20 | [NA]		[NA]	[NA]
Benzo(a)pyrene	mg/kg	0.050	<0.050	<0.050 | <0.050 | [NA]		101	110
Indeno(1,2,3-c,d)pyrene	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Dibenzo(a,h)anthracene	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Benzo(g,h,i)perylene	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Surrogate p-Terphenyl-D14	*%*		*101*	*107 | 107*		*102*	*102*

Analyte	Units	PQL	Blank	DUP3 BGF1279-DUP3# Samp | QC | RPD %	DUP4 BGF1279-DUP4# Samp | QC | RPD %	LCS %
Naphthalene	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Acenaphthylene	mg/kg	0.1		0.200 | 0.258 | [NA]		[NA]
Acenaphthene	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Fluorene	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Phenanthrene	mg/kg	0.1		0.402 | 0.631 | 44.3		[NA]
Anthracene	mg/kg	0.1		0.149 | 0.228 | [NA]		[NA]
Fluoranthene	mg/kg	0.1		1.84 | 2.53 | 31.6		[NA]
Pyrene	mg/kg	0.1		1.98 | 2.74 | 32.4		[NA]
Benzo(a)anthracene	mg/kg	0.1		0.859 | 1.21 | 33.6		[NA]
Chrysene	mg/kg	0.1		1.07 | 1.41 | 28.0		[NA]
Benzo(b,j,k)fluoranthene	mg/kg	0.2		2.41 | 3.04 | 23.0		[NA]
Benzo(a)pyrene	mg/kg	0.05		1.51 | 1.96 | 25.9		[NA]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1		1.13 | 1.39 | 20.9		[NA]
Dibenzo(a,h)anthracene	mg/kg	0.1		0.199 | 0.253 | [NA]		[NA]
Benzo(g,h,i)perylene	mg/kg	0.1		1.11 | 1.39 | 22.1		[NA]
Surrogate p-Terphenyl-D14	*%*			*108 | 108*		*[NA]*

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control MGF0098

ORG-022_OC|Organochlorine Pesticides (Soil) | Batch BGF1279

Analyte	Units	PQL	Blank	DUP1 BGF1279-DUP1# Samp | QC | RPD %	DUP2 BGF1279-DUP2# Samp | QC | RPD %	LCS %	Spike % MGF0098-02
alpha-BHC	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		103	109
Hexachlorobenzene	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
beta-BHC	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		97.6	108
gamma-BHC	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
delta-BHC	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Heptachlor	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		90.5	94.8
Aldrin	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		95.8	101
Heptachlor epoxide	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		116	125
trans-Chlordane	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
cis-Chlordane	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Endosulfan I	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
4,4'-DDE	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		107	115
Dieldrin	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		104	112
Endrin	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		106	110
4,4'-DDD	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		112	120
Endosulfan II	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Endrin aldehyde	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
4,4'-DDT	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Endosulfan sulfate	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		98.8	109
Endrin ketone	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Methoxychlor	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Mirex	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Surrogate 4-chloro-3-nitrobenzotrifluoride	*%*		*114*	*113 / 111*		*110*	*110*

Analyte	Units	PQL	Blank	DUP3 BGF1279-DUP3# Samp | QC | RPD %	DUP4 BGF1279-DUP4# Samp | QC | RPD %	LCS %
alpha-BHC	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Hexachlorobenzene	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
beta-BHC	mg/kg	0.1		<0.20 | <0.20 | [NA] [1]		[NA]
gamma-BHC	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
delta-BHC	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Heptachlor	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Aldrin	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Heptachlor epoxide	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
trans-Chlordane	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
cis-Chlordane	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Endosulfan I	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
4,4'-DDE	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Dieldrin	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Endrin	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
4,4'-DDD	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Endosulfan II	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Endrin aldehyde	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
4,4'-DDT	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Endosulfan sulfate	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Endrin ketone	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Methoxychlor	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Mirex	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Surrogate 4-chloro-3-nitrobenzotrifluoride	*%*			*109 / 111*		*[NA]*

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control MGF0098

ORG-022|Organophosphorus Pesticides (Soil) | Batch BGF1279

Analyte	Units	PQL	Blank	DUP1 BGF1279-DUP1# Samp | QC | RPD %	DUP2 BGF1279-DUP2# Samp | QC | RPD %	LCS %	Spike % MGF0098-02
Dichlorvos	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		101	111
Dimethoate	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Diazinon	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Chlorpyrifos-methyl	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		104	114
Ronnel	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		108	116
Fenitrothion	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		109	123
Malathion	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		102	112
Chlorpyrifos	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		108	115
Parathion	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		99.5	108
Bromophos-ethyl	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Ethion	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		105	116
Coumaphos	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Disulfoton	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Fenamiphos	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Fenthion	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Methidathion	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Mevinphos	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Parathion-methyl	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Phorate	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Phosalone	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Azinphos-methyl	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Surrogate 4-chloro-3-nitrobenzotrifluoride	*%*		*114*	*113 | 111*		*110*	*110*

Analyte	Units	PQL	Blank	DUP3 BGF1279-DUP3# Samp | QC | RPD %	DUP4 BGF1279-DUP4# Samp | QC | RPD %	LCS %
Dichlorvos	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Dimethoate	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Diazinon	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Chlorpyrifos-methyl	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Ronnel	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Fenitrothion	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Malathion	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Chlorpyrifos	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Parathion	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Bromophos-ethyl	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Ethion	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Coumaphos	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Disulfoton	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Fenamiphos	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Fenthion	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Methidathion	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Mevinphos	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Parathion-methyl	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Phorate	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Phosalone	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Azinphos-methyl	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Surrogate 4-chloro-3-nitrobenzotrifluoride	*%*			*109 | 111*		*[NA]*

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control MGF0098

ORG-021/022/025_PCB | Polychlorinated Biphenyls (Soil) | Batch BGF1279

Analyte	Units	PQL	Blank	DUP1 BGF1279-DUP1# Samp | QC | RPD %	DUP2 BGF1279-DUP2# Samp | QC | RPD %	LCS %	Spike % MGF0098-02
Aroclor 1016	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Aroclor 1221	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Aroclor 1232	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Aroclor 1242	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Aroclor 1248	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Aroclor 1254	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
Aroclor 1260	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		[NA]	[NA]
PCB C103	mg/kg			0.00 | 0.00 | [NA]		107	115
Surrogate 2-Fluorobiphenyl	*%*		*105*	*104 | 104*		*103*	*104*

Analyte	Units	PQL	Blank	DUP3 BGF1279-DUP3# Samp | QC | RPD %	DUP4 BGF1279-DUP4# Samp | QC | RPD %	LCS %
Aroclor 1016	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Aroclor 1221	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Aroclor 1232	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Aroclor 1242	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Aroclor 1248	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Aroclor 1254	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
Aroclor 1260	mg/kg	0.1		<0.10 | <0.10 | [NA]		[NA]
PCB C103	mg/kg			0.00 | 0.00 | [NA]		[NA]
Surrogate 2-Fluorobiphenyl	*%*			*102 | 106*		*[NA]*

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-020 | Acid Extractable Metals (Soil) | Batch BGF1277

Analyte	Units	PQL	Blank	DUP1 BGF1277-DUP1# Samp | QC | RPD %	DUP2 BGF1277-DUP2# Samp | QC | RPD %	LCS %	Spike % MGF0098-02
Arsenic	mg/kg	4.0	<4.0	<4.0 | <4.0 | [NA]		103	98.2
Cadmium	mg/kg	0.40	<0.40	<0.40 | <0.40 | [NA]		103	89.3
Chromium	mg/kg	1.0	<1.0	15.8 | 15.4 | 2.73		101	100
Copper	mg/kg	1.0	<1.0	13.1 | 11.9 | 8.84		104	96.2
Lead	mg/kg	1.0	<1.0	9.12 | 8.87 | 2.81		96.6	89.0
Mercury	mg/kg	0.10	<0.10	<0.10 | <0.10 | [NA]		106	107
Nickel	mg/kg	1.0	<1.0	14.6 | 15.0 | 3.08		98.7	87.8
Zinc	mg/kg	1.0	<1.0	52.8 | 53.7 | 1.70		99.2	85.8

Analyte	Units	PQL	Blank	DUP3 BGF1277-DUP3# Samp | QC | RPD %	DUP4 BGF1277-DUP4# Samp | QC | RPD %	LCS %
Arsenic	mg/kg	4		4.13 | <4.0 | [NA]		[NA]
Cadmium	mg/kg	0.4		<0.40 | <0.40 | [NA]		[NA]
Chromium	mg/kg	1		16.1 | 14.3 | 11.4		[NA]
Copper	mg/kg	1		21.4 | 18.6 | 13.9		[NA]
Lead	mg/kg	1		35.6 | 30.9 | 14.2		[NA]
Mercury	mg/kg	0.1		<0.10 | 0.407 | [NA]		[NA]
Nickel	mg/kg	1		8.99 | 7.61 | 16.6		[NA]
Zinc	mg/kg	1		67.8 | 58.1 | 15.3		[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-008 | Inorganics - Moisture (Soil) | Batch BGF1274

Analyte	Units	PQL	Blank	DUP1 BGF1274-DUP1# Samp | QC | RPD %	DUP2 BGF1274-DUP2# Samp | QC | RPD %	LCS %
Moisture	%	0.1		15.1 | 14.8 | 1.61	5.98 | 7.19 | 18.4	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control MGF0098

QC Comments

Identifier	Description
[1]	PQL(s) has/have been raised due to matrix interference.

#382376
3/6/25

CHAIN OF CUSTODY - Client

ENVIROLAB SERVICES

Client:	Geo-Environmental Engineering Pty Ltd
Project Mgr:	Stephen McCormack
Sampler:	Stephen Mccormack
Address:	Unit 2, 5-7 Malta Street, Fairfield East
Email:	stephen@geoenvironmental.com.au
Phone:	0431 480 980 (Stephen)

Client Project Name and Number: E24016FOR

PO No.:

Envirolab Services Quote No. :

Date results required:
Or choose: standard / 1 day / 2 day / 3 day / 5 day — **4 days if possible**
Note: Inform lab in advance if urgent turnaround is required - surcharge applies

Envirolab Services
5 Research Dr, Croydon South VIC 3136
Phone: 03 9763 2500
E-mail: melbourne@envirolab.com.au

Sample information				Tests Required														Comments
Envirolab Sample ID	Client Sample ID	Date sampled	Type of sample	Combination 3	Combination 3a	Combination 5	Combination 5a	PAHs	Metals (S8)	OCP/OPPs				TRH (vol)/BTEXN	BTEXN	Combo 1m		Hold	Provide as much information about the sample as you can
1	SM030625-105	3/06/2025	Soil			1													
2	SM030625-101	3/06/2025	Soil	1															
3	SM030625-103	3/06/2025	Soil						1	1									

Relinquished by (company):	Geo-Environmental Engineering
Print Name:	Stephen McCormack
Date & Time:	03-Jun-25
Signature:	

Received by (company):	ELS Melb
Print Name:	JJ
Date & Time:	5/06/25 2:05
Signature:	

Samples Received: Cool or Ambient (circle one) Iced Sep
Temperature Recieved at: 12.5 (if applicable)
Transported by: Hand delivered / courier
MGF00098

Relinquished by: ELS SYD
Katherine Chavez
4/6/25 1120
KC

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 357493

Client Details

Client	Geo-Environmental Engineering
Attention	Stephen McCormack
Address	82 Bridge St, Lane Cove, NSW, 2066

Sample Details

Your Reference	**E24016FOR**
Number of Samples	5 Soil, 3 Water
Date samples received	25/07/2024
Date completed instructions received	25/07/2024

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	01/08/2024
Date of Issue	01/08/2024

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Asbestos Approved By
Analysed by Asbestos Approved Analyst: Lucy Zhu
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Dragana Tomas, Senior Chemist
Giovanni Agosti, Group Technical Manager
Lucy Zhu, Asbestos Supervisor
Timothy Toll, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		357493-1	357493-2	357493-3	357493-5	357493-6
Your Reference	UNITS	ZZ250724-01	ZZ250724-02	ZZ250724-03	ZZ250724-100	Trip Blank
Date Sampled		25/07/2024	25/07/2024	25/07/2024	25/07/2024	25/07/2024
Type of sample		Soil	Soil	Soil	Soil	Water
Date extracted	-	29/07/2024	29/07/2024	29/07/2024	29/07/2024	29/07/2024
Date analysed	-	30/07/2024	30/07/2024	30/07/2024	30/07/2024	01/08/2024
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTRH 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	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	63	72	67	77	98

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		357493-7
Your Reference	UNITS	Trip Spike
Date Sampled		25/07/2024
Type of sample		Water
Date extracted	-	29/07/2024
Date analysed	-	01/08/2024
Benzene	mg/kg	82%
Toluene	mg/kg	81%
Ethylbenzene	mg/kg	81%
m+p-xylene	mg/kg	82%
o-Xylene	mg/kg	82%
Surrogate aaa-Trifluorotoluene	%	90

svTRH (C10-C40) in Soil					
Our Reference		357493-1	357493-2	357493-3	357493-5
Your Reference	UNITS	ZZ250724-01	ZZ250724-02	ZZ250724-03	ZZ250724-100
Date Sampled		25/07/2024	25/07/2024	25/07/2024	25/07/2024
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	29/07/2024	29/07/2024	29/07/2024	29/07/2024
Date analysed	-	30/07/2024	30/07/2024	30/07/2024	30/07/2024
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
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50
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	%	81	77	78	77

PAHs in Soil					
Our Reference		357493-1	357493-2	357493-3	357493-5
Your Reference	UNITS	ZZ250724-01	ZZ250724-02	ZZ250724-03	ZZ250724-100
Date Sampled		25/07/2024	25/07/2024	25/07/2024	25/07/2024
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	29/07/2024	29/07/2024	29/07/2024	29/07/2024
Date analysed	-	30/07/2024	30/07/2024	30/07/2024	30/07/2024
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	<0.1	<0.1	<0.1	<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	<0.05	<0.05	<0.05	<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	<0.05	<0.05	<0.05	<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	%	97	95	76	99

Organochlorine Pesticides in soil				
Our Reference		357493-1	357493-2	357493-5
Your Reference	UNITS	ZZ250724-01	ZZ250724-02	ZZ250724-100
Date Sampled		25/07/2024	25/07/2024	25/07/2024
Type of sample		Soil	Soil	Soil
Date extracted	-	29/07/2024	29/07/2024	29/07/2024
Date analysed	-	30/07/2024	30/07/2024	30/07/2024
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Mirex	mg/kg	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	97	92	100

PCBs in Soil				
Our Reference		357493-1	357493-2	357493-5
Your Reference	UNITS	ZZ250724-01	ZZ250724-02	ZZ250724-100
Date Sampled		25/07/2024	25/07/2024	25/07/2024
Type of sample		Soil	Soil	Soil
Date extracted	-	29/07/2024	29/07/2024	29/07/2024
Date analysed	-	30/07/2024	30/07/2024	30/07/2024
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1
Surrogate 2-Fluorobiphenyl	%	92	92	98

Acid Extractable metals in soil					
Our Reference		357493-1	357493-2	357493-3	357493-5
Your Reference	UNITS	ZZ250724-01	ZZ250724-02	ZZ250724-03	ZZ250724-100
Date Sampled		25/07/2024	25/07/2024	25/07/2024	25/07/2024
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	29/07/2024	29/07/2024	29/07/2024	29/07/2024
Date analysed	-	30/07/2024	30/07/2024	30/07/2024	30/07/2024
Arsenic	mg/kg	14	12	6	8
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	34	16	29	17
Copper	mg/kg	2	7	<1	13
Lead	mg/kg	13	24	9	19
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	2	7	1	24
Zinc	mg/kg	7	35	6	35

Moisture					
Our Reference		357493-1	357493-2	357493-3	357493-5
Your Reference	UNITS	ZZ250724-01	ZZ250724-02	ZZ250724-03	ZZ250724-100
Date Sampled		25/07/2024	25/07/2024	25/07/2024	25/07/2024
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	29/07/2024	29/07/2024	29/07/2024	29/07/2024
Date analysed	-	30/07/2024	30/07/2024	30/07/2024	30/07/2024
Moisture	%	6.1	9.9	7.9	4.7

Asbestos ID - soils			
Our Reference		357493-1	357493-2
Your Reference	UNITS	ZZ250724-01	ZZ250724-02
Date Sampled		25/07/2024	25/07/2024
Type of sample		Soil	Soil
Date analysed	-	31/07/2024	31/07/2024
Sample mass tested	g	Approx. 30g	Approx. 30g
Sample Description	-	Orange 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
Asbestos comments	-	Nil	Nil
Trace Analysis	-	No asbestos detected	No asbestos detected

vTRH(C6-C10)/BTEXN in Water		
Our Reference	UNITS	357493-8
Your Reference		ZZ250724-R
Date Sampled		25/07/2024
Type of sample		Water
Date extracted	-	29/07/2024
Date analysed	-	30/07/2024
TRH C_6 - C_9	µg/L	<10
TRH C_6 - C_{10}	µg/L	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	102
Surrogate Toluene-d8	%	98
Surrogate 4-Bromofluorobenzene	%	94

svTRH (C10-C40) in Water		
Our Reference		357493-8
Your Reference	UNITS	ZZ250724-R
Date Sampled		25/07/2024
Type of sample		Water
Date extracted	-	29/07/2024
Date analysed	-	30/07/2024
TRH C_{10} - C_{14}	µg/L	<50
TRH C_{15} - C_{28}	µg/L	<100
TRH C_{29} - C_{36}	µg/L	<100
Total +ve TRH (C10-C36)	µg/L	<50
TRH >C_{10} - C_{16}	µg/L	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50
TRH >C_{16} - C_{34}	µg/L	<100
TRH >C_{34} - C_{40}	µg/L	<100
Total +ve TRH (>C10-C40)	µg/L	<50
Surrogate o-Terphenyl	%	78

Metals in Waters - Acid extractable		
Our Reference		357493-8
Your Reference	UNITS	ZZ250724-R
Date Sampled		25/07/2024
Type of sample		Water
Date prepared	-	29/07/2024
Date analysed	-	29/07/2024
Arsenic - Total	mg/L	<0.05
Cadmium - Total	mg/L	<0.01
Chromium - Total	mg/L	<0.01
Copper - Total	mg/L	<0.01
Lead - Total	mg/L	<0.03
Mercury - Total	mg/L	<0.0005
Nickel - Total	mg/L	<0.02
Zinc - Total	mg/L	<0.02

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-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
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-021/022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD and/or GC-MS/GC-MSMS. 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-022/025	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.

Method ID	Methodology Summary
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	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.
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-9	[NT]
Date extracted	-			29/07/2024	1	29/07/2024	29/07/2024		29/07/2024	[NT]
Date analysed	-			30/07/2024	1	30/07/2024	30/07/2024		30/07/2024	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	104	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	104	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	107	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	103	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	102	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	105	[NT]
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	104	[NT]
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	115	1	63	105	50	109	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			29/07/2024	1	29/07/2024	29/07/2024		29/07/2024	[NT]
Date analysed	-			30/07/2024	1	30/07/2024	30/07/2024		30/07/2024	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	90	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	86	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	86	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	90	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	<100	<100	0	86	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	86	[NT]
Surrogate o-Terphenyl	%		Org-020	79	1	81	79	2	105	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			29/07/2024	1	29/07/2024	29/07/2024		29/07/2024	[NT]
Date analysed	-			30/07/2024	1	30/07/2024	30/07/2024		30/07/2024	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	82	[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	82	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	90	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	84	[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	70	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	74	[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	76	[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	<0.05	<0.05	0	70	[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	84	1	97	100	3	87	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			29/07/2024	1	29/07/2024	29/07/2024		29/07/2024	[NT]
Date analysed	-			30/07/2024	1	30/07/2024	30/07/2024		30/07/2024	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	84	[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	82	[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	82	[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	88	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	100	[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	84	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	92	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	104	[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	92	[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	98	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	108	1	97	101	4	101	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			29/07/2024	1	29/07/2024	29/07/2024		29/07/2024	[NT]
Date analysed	-			30/07/2024	1	30/07/2024	30/07/2024		30/07/2024	[NT]
Aroclor 1016	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	102	[NT]
Aroclor 1260	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate 2-Fluorobiphenyl	%		Org-021/022/025	105	1	92	99	7	96	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date prepared	-			29/07/2024	1	29/07/2024	29/07/2024		29/07/2024	[NT]
Date analysed	-			30/07/2024	1	30/07/2024	30/07/2024		30/07/2024	[NT]
Arsenic	mg/kg	4	Metals-020	<4	1	14	15	7	101	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	94	[NT]
Chromium	mg/kg	1	Metals-020	<1	1	34	36	6	92	[NT]
Copper	mg/kg	1	Metals-020	<1	1	2	1	67	89	[NT]
Lead	mg/kg	1	Metals-020	<1	1	13	12	8	94	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	98	[NT]
Nickel	mg/kg	1	Metals-020	<1	1	2	2	0	94	[NT]
Zinc	mg/kg	1	Metals-020	<1	1	7	8	13	97	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			29/07/2024	[NT]	[NT]	[NT]	[NT]	29/07/2024	[NT]
Date analysed	-			30/07/2024	[NT]	[NT]	[NT]	[NT]	30/07/2024	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	88	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	88	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	86	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	87	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	104	[NT]	[NT]	[NT]	[NT]	106	[NT]
Surrogate Toluene-d8	%		Org-023	99	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	96	[NT]	[NT]	[NT]	[NT]	98	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			29/07/2024	[NT]	[NT]	[NT]	[NT]	29/07/2024	[NT]
Date analysed	-			29/07/2024	[NT]	[NT]	[NT]	[NT]	29/07/2024	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	93	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	94	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	114	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	93	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	94	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	114	[NT]
Surrogate o-Terphenyl	%		Org-020	93	[NT]	[NT]	[NT]	[NT]	91	[NT]

QUALITY CONTROL: Metals in Waters - Acid extractable						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			29/07/2024	[NT]	[NT]	[NT]	[NT]	29/07/2024	[NT]
Date analysed	-			29/07/2024	[NT]	[NT]	[NT]	[NT]	29/07/2024	[NT]
Arsenic - Total	mg/L	0.05	Metals-020	<0.05	[NT]	[NT]	[NT]	[NT]	103	[NT]
Cadmium - Total	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	102	[NT]
Chromium - Total	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	96	[NT]
Copper - Total	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	99	[NT]
Lead - Total	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	96	[NT]
Mercury - Total	mg/L	0.0005	Metals-021	<0.0005	[NT]	[NT]	[NT]	[NT]	111	[NT]
Nickel - Total	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	94	[NT]
Zinc - Total	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	99	[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.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

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 according to ASB-001 asbestos subsampling procedure. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab/MPL recommends supplying 40-60g or 500ml of sample in its own container.
Note: Samples 357493-1 & 2 were sub-sampled from jars provided by the client.

Updated COC 25/7/24. 1624.

CHAIN OF CUSTODY - Client

ENVIROLAB SERVICES

Client:	Geo-Environmental Engineering Pty Ltd	**Client Project Name and Number:** E24016FOR	**Envirolab Services** 12 Ashley St, Chatswood, NSW, 2067
Project Mgr:	Stephen McCormack	**PO No.:**	Phone: 02 9910 6200
Sampler:	Stephen Mccormack	**Envirolab Services Quote No. :**	Fax: 02 9910 6201
Address:	Unit 2, 5-7 Malta Street, Fairfield East	**Date results required:**	E-mail: ahie@envirolabservices.com.au
Email:	stephen@geoenvironmental.com.au, zachary@geoenvironmental.com.au, chase@geoenvironmental.com.au, sally@geoenvironmental.com.au	Or choose: standard / 1 day / 2 day / 3 day / 5 day **Standard** *Note: Inform lab in advance if urgent turnaround is required - surcharge applies*	Contact: Aileen Hie / Simon Song
Phone:	0458 550 257 (Sally) / 0431 480 980 (Stephen)		

Sample information				Tests Required														Comments
Envirolab Sample ID	Client Sample ID	Date sampled	Type of sample	Combination 5a	Combination 5	Combination 3	TRH (vol)/BTEXN	BTEXN	Combo 1m								Hold	Provide as much information about the sample as you can
1	ZZ250724-01	25/07/2024	Soil	x														
2	ZZ250724-02	25/07/2024	Soil	x														
3	ZZ250724-03	25/07/2024	Soil			x												
4	ZZ250724-04	25/07/2024	Soil														x	
5	ZZ250724-100	25/07/2024	Soil		x													
6	Trip Blank	25/07/2024	Water				x											
7	Trip Spike	25/07/2024	Water					x										
8	ZZ250724-R	25/07/2024	Water						x									

Relinquished by (company):	Geo-Environmental Engineering	**Received by (company):** ENVSYD	**Samples Received:** Cool or Ambient (circle one)
Print Name:	Sally Gartland	**Print Name:** D.WU	**Temperature Recieved at:** 2 (if applicable)
Date & Time:	25-Jul-24	**Date & Time:** 25/7/24, 1300	**Transported by:** Hand delivered / courier
Signature:		**Signature:** DW	#357493. **Page No:** 1 of 1

COC 25/7/24, 1547

CHAIN OF CUSTODY - Client

ENVIROLAB SERVICES

Client:	Geo-Environmental Engineering Pty Ltd	**Client Project Name and Number:**	**Envirolab Services**
Project Mgr:	Stephen McCormack	E24016FOR	**12 Ashley St, Chatswood, NSW, 2067**
Sampler:	Stephen Mccormack	**PO No.:**	**Phone: 02 9910 6200**
Address:	Unit 2, 5-7 Malta Street, Fairfield East	**Envirolab Services Quote No. :**	**Fax: 02 9910 6201**
Email:	stephen@geoenvironmental.com.au, zachary@geoenvironmental.com.au, chase@geoenvironmental.com.au, sally@geoenvironmental.com.au	**Date results required:**	**E-mail: ahie@envirolabservices.com.au**
		Or choose: standard / 1 day / 2 day / 3 day / 5 day **Standard**	**Contact: Aileen Hie / Simon Song**
Phone:	0458 550 257 (Sally) / 0431 480 980 (Stephen)	*Note: Inform lab in advance if urgent turnaround is required - surcharge applies*	

Sample information				Tests Required														Comments
Envirolab Sample ID	**Client Sample ID**	**Date sampled**	**Type of sample**	**Combination 5a**	**Combination 5**	**Combination 3**	**TRH (vol)/BTEXN**	**BTEXN**	**8 Metals**								**Hold**	**Provide as much information about the sample as you can**
1	ZZ250724-01	25/07/2024	Soil	x														
2	ZZ250724-02	25/07/2024	Soil	x														
3	ZZ250724-03	25/07/2024	Soil			x												
4	ZZ250724-04	25/07/2024	Soil														x	
5	ZZ250724-100	25/07/2024	Soil		x													
6	Trip Blank	25/07/2024	Water			x												
7	Trip Spike	25/07/2024	Water				x											
8	ZZ250724-R	25/07/2024	Water			x	x	x										

Relinquished by (company):	Geo-Environmental Engineering	**Received by (company):** EJ SYD	**Samples Received:** Cool or Ambient (circle one)
Print Name:	Sally Gartland	**Print Name:** O. Wilcox.	**Temperature Recieved at:** 2 . (if applicable)
Date & Time:	25-Jul-24	**Date & Time:** 25/7/24 1300	**Transported by:** Hand delivered / courier
Signature:		**Signature:**	#357493 **Page No: 1 of 1**

Envirolab Services Pty Ltd
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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 358508

Client Details

Client	Geo-Environmental Engineering
Attention	Stephen McCormack
Address	82 Bridge St, Lane Cove, NSW, 2066

Sample Details

Your Reference	**E24016FOR**
Number of Samples	6 Water
Date samples received	06/08/2024
Date completed instructions received	06/08/2024

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	13/08/2024
Date of Issue	12/08/2024

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Results Approved By
Dragana Tomas, Senior Chemist
Giovanni Agosti, Group Technical Manager
Timothy Toll, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

VOCs in water					
Our Reference		358508-1	358508-2	358508-3	358508-4
Your Reference	UNITS	ZZ060824-01	ZZ060824-02	ZZ060824-03	ZZ060824-101
Date Sampled		06/08/2024	06/08/2024	06/08/2024	06/08/2024
Type of sample		Water	Water	Water	Water
Date Extracted	-	08/08/2024	08/08/2024	08/08/2024	08/08/2024
Date Analysed	-	09/08/2024	09/08/2024	09/08/2024	09/08/2024
Dichlorodifluoromethane	µg/L	<10	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1
Chloroform	µg/L	4	2	<1	4
2,2-dichloropropane	µg/L	<1	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1
Benzene	µg/L	<1	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1	<1
Toluene	µg/L	1	<1	<1	1
1,3-dichloropropane	µg/L	<1	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1

VOCs in water					
Our Reference		358508-1	358508-2	358508-3	358508-4
Your Reference	UNITS	ZZ060824-01	ZZ060824-02	ZZ060824-03	ZZ060824-101
Date Sampled		06/08/2024	06/08/2024	06/08/2024	06/08/2024
Type of sample		Water	Water	Water	Water
Bromoform	µg/L	<1	<1	<1	<1
m+p-xylene	µg/L	2	<2	<2	2
Styrene	µg/L	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1	<1
o-xylene	µg/L	2	<1	<1	2
1,2,3-trichloropropane	µg/L	<1	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	10	<1	<1	11
Tert-butyl benzene	µg/L	<1	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	19	<1	<1	21
1,3-dichlorobenzene	µg/L	<1	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	97	100	80	97
Surrogate Toluene-d8	%	120	103	101	105
Surrogate 4-Bromofluorobenzene	%	99	99	92	112

vTRH(C6-C10)/BTEXN in Water						
Our Reference		358508-1	358508-2	358508-3	358508-4	358508-5
Your Reference	UNITS	ZZ060824-01	ZZ060824-02	ZZ060824-03	ZZ060824-101	Trip Blank
Date Sampled		06/08/2024	06/08/2024	06/08/2024	06/08/2024	06/08/2024
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	08/08/2024	08/08/2024	08/08/2024	08/08/2024	08/08/2024
Date analysed	-	09/08/2024	09/08/2024	09/08/2024	09/08/2024	09/08/2024
TRH C_6 - C_9	µg/L	15	<10	<10	13	<10
TRH C_6 - C_{10}	µg/L	70	<10	<10	61	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	65	<10	<10	55	<10
Benzene	µg/L	<1	<1	<1	<1	<1
Toluene	µg/L	1	<1	<1	1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1
m+p-xylene	µg/L	2	<2	<2	2	<2
o-xylene	µg/L	2	<1	<1	2	<1
Naphthalene	µg/L	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	97	100	80	97	96
Surrogate Toluene-d8	%	120	103	101	105	106
Surrogate 4-Bromofluorobenzene	%	99	99	92	112	97

vTRH(C6-C10)/BTEXN in Water		
Our Reference		358508-6
Your Reference	UNITS	Trip Spike
Date Sampled		06/08/2024
Type of sample		Water
Date extracted	-	08/08/2024
Date analysed	-	09/08/2024
Benzene	µg/L	93%
Toluene	µg/L	105%
Ethylbenzene	µg/L	100%
m+p-xylene	µg/L	101%
o-xylene	µg/L	102%
Surrogate Dibromofluoromethane	%	96
Surrogate Toluene-d8	%	104
Surrogate 4-Bromofluorobenzene	%	100

svTRH (C10-C40) in Water					
Our Reference		358508-1	358508-2	358508-3	358508-4
Your Reference	UNITS	ZZ060824-01	ZZ060824-02	ZZ060824-03	ZZ060824-101
Date Sampled		06/08/2024	06/08/2024	06/08/2024	06/08/2024
Type of sample		Water	Water	Water	Water
Date extracted	-	07/08/2024	07/08/2024	07/08/2024	07/08/2024
Date analysed	-	08/08/2024	08/08/2024	08/08/2024	08/08/2024
TRH C_{10} - C_{14}	µg/L	120	<50	<50	130
TRH C_{15} - C_{28}	µg/L	<100	<100	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	120	<50	<50	130
TRH >C_{10} - C_{16}	µg/L	92	<50	<50	95
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	92	<50	<50	95
TRH >C_{16} - C_{34}	µg/L	<100	<100	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	90	<50	<50	100
Surrogate o-Terphenyl	%	80	75	88	83

PAHs in Water					
Our Reference		358508-1	358508-2	358508-3	358508-4
Your Reference	UNITS	ZZ060824-01	ZZ060824-02	ZZ060824-03	ZZ060824-101
Date Sampled		06/08/2024	06/08/2024	06/08/2024	06/08/2024
Type of sample		Water	Water	Water	Water
Date extracted	-	07/08/2024	07/08/2024	07/08/2024	07/08/2024
Date analysed	-	08/08/2024	08/08/2024	08/08/2024	08/08/2024
Naphthalene	µg/L	0.1	<0.1	<0.1	0.1
Acenaphthylene	µg/L	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<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
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	0.1	<0.1	<0.1	0.12
Surrogate p-Terphenyl-d14	%	68	64	86	76

HM in water - dissolved					
Our Reference	UNITS	358508-1	358508-2	358508-3	358508-4
Your Reference		ZZ060824-01	ZZ060824-02	ZZ060824-03	ZZ060824-101
Date Sampled		06/08/2024	06/08/2024	06/08/2024	06/08/2024
Type of sample		Water	Water	Water	Water
Date prepared	-	07/08/2024	07/08/2024	07/08/2024	07/08/2024
Date analysed	-	07/08/2024	07/08/2024	07/08/2024	07/08/2024
Arsenic-Dissolved	µg/L	<1	<1	<1	<1
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1	<1	<1
Copper-Dissolved	µg/L	<1	3	2	<1
Lead-Dissolved	µg/L	<1	<1	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	20	8	2	19
Zinc-Dissolved	µg/L	37	31	7	36

Cations in water Dissolved					
Our Reference		358508-1	358508-2	358508-3	358508-4
Your Reference	UNITS	ZZ060824-01	ZZ060824-02	ZZ060824-03	ZZ060824-101
Date Sampled		06/08/2024	06/08/2024	06/08/2024	06/08/2024
Type of sample		Water	Water	Water	Water
Date digested	-	07/08/2024	07/08/2024	07/08/2024	07/08/2024
Date analysed	-	09/08/2024	09/08/2024	09/08/2024	09/08/2024
Magnesium - Dissolved	mg/L	12	5	5.3	13
Calcium - Dissolved	mg/L	11	1	3	11
Hardness (calc) equivalent $CaCO_3$	mg/L	79	22	29	80

Method ID	Methodology Summary
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. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Salt forms (e.g. FeO, PbO, ZnO) are determined stoichiometrically from the base metal concentration.
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	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	-			08/08/2024	1	08/08/2024	09/08/2024		08/08/2024	[NT]
Date Analysed	-			09/08/2024	1	09/08/2024	09/08/2024		09/08/2024	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	105	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	1	4	4	0	108	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	110	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	113	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	106	[NT]
Dibromomethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	112	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	113	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	1	1	1	0	118	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	80	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	82	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	109	[NT]
Bromoform	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	2	2	0	111	[NT]
Styrene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	1	<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	1	2	2	0	110	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	1	10	9	11	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	1	19	19	0	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	92	1	97	107	10	102	[NT]
Surrogate Toluene-d8	%		Org-023	98	1	120	97	21	108	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	86	1	99	101	2	106	[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	-			08/08/2024	1	08/08/2024	09/08/2024		08/08/2024	[NT]
Date analysed	-			09/08/2024	1	09/08/2024	09/08/2024		09/08/2024	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	1	15	14	7	111	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	1	70	67	4	111	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	106	[NT]
Toluene	µg/L	1	Org-023	<1	1	1	1	0	118	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	109	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	2	2	0	111	[NT]
o-xylene	µg/L	1	Org-023	<1	1	2	2	0	110	[NT]
Naphthalene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	92	1	97	107	10	102	[NT]
Surrogate Toluene-d8	%		Org-023	98	1	120	97	21	108	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	86	1	99	101	2	106	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	358508-2
Date extracted	-			07/08/2024	1	07/08/2024	07/08/2024		07/08/2024	07/08/2024
Date analysed	-			07/08/2024	1	08/08/2024	08/08/2024		07/08/2024	08/08/2024
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	1	120	110	9	110	110
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	1	<100	<100	0	104	102
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	1	<100	<100	0	100	102
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	1	92	81	13	110	110
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	1	<100	<100	0	104	102
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	1	<100	<100	0	100	102
Surrogate o-Terphenyl	%		Org-020	106	1	80	67	18	106	117

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	358508-2
Date extracted	-			07/08/2024	1	07/08/2024	07/08/2024		07/08/2024	07/08/2024
Date analysed	-			08/08/2024	1	08/08/2024	08/08/2024		08/08/2024	08/08/2024
Naphthalene	µg/L	0.1	Org-022/025	<0.1	1	0.1	0.1	0	85	72
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	72
Fluorene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	81	73
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	90	71
Anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	89	69
Pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	89	71
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	72
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	93	62
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	85	1	68	68	0	85	78

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W7	[NT]
Date prepared	-			07/08/2024	2	07/08/2024	07/08/2024		07/08/2024	[NT]
Date analysed	-			07/08/2024	2	07/08/2024	07/08/2024		07/08/2024	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	2	<1	<1	0	97	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	2	<0.1	<0.1	0	102	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	2	<1	<1	0	109	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	2	3	4	29	107	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	2	<1	<1	0	107	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	2	<0.05	[NT]		116	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	2	8	9	12	108	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	2	31	33	6	107	[NT]

QUALITY CONTROL: Cations in water Dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date digested	-			07/08/2024	[NT]	[NT]	[NT]	[NT]	07/08/2024	[NT]
Date analysed	-			09/08/2024	[NT]	[NT]	[NT]	[NT]	09/08/2024	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	89	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	92	[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.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

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.

CHAIN OF CUSTODY - Client

ENVIROLAB SERVICES

Client:	Geo-Environmental Engineering Pty Ltd
Project Mgr:	Stephen McCormack
Sampler:	Stephen Mccormack
Address:	Unit 2, 5-7 Malta Street, Fairfield East
Email:	stephen@geoenvironmental.com.au, zachary@geoenvironmental.com.au, chase@geoenvironmental.com.au, sally@geoenvironmental.com.au
Phone:	0458 550 257 (Sally) / 0431 480 930 (Stephen)

Client Project Name and Number:	E24016FOR
PO No.:	
Envirolab Services Quote No. :	
Date results required:	Or choose: standard / 1 day / 2 day / 3 day / 5 day — **Standard** *Note: Inform lab in advance if urgent turnaround is required - surcharge applies*

Envirolab Services
12 Ashley St, Chatswood, NSW, 2067

Phone: 02 9910 6200
Fax: 02 9910 6201

E-mail: ahie@envirolabservices.com.au

Contact: Aileen Hie / Simon Song

Sample information				Tests Required														Comments
Envirolab Sample ID	Client Sample ID	Date sampled	Type of sample	CW003_D	VOC's	Hardness		TRH (vol) / BTEXN	BTEXN								Hold	Provide as much information about the sample as you can
1	ZZ060824-01	6/08/2024	Water	X	X	X												
2	ZZ060824-02	6/08/2024	Water	X	X	X												
3	ZZ060824-03	6/08/2024	Water	X	X	X												
4	ZZ060824-101	6/08/2024	Water	X	X	X												
5	Trip Blank	6/08/2024	Water					X										
6	Trip Spike	6/08/2024	Water						X									

Relinquished by (company):	Geo-Environmental Engineering	**Received by (company):**	ELS
Print Name:	Sally Gartland	**Print Name:**	Tony Trinh
Date & Time:	05-Aug-24	**Date & Time:**	6-08-24 1430
Signature:		**Signature:**	T. Trinh

Samples Received: Cool or Ambient (circle one)
Temperature Recieved at: 4°C **(if applicable)**
Transported by: Hand delivered / courier
#358508