eiaustralia

Contamination | Remediation | Geotechnical

MMDA PTY LTD

Detailed Site Investigation (Updated Report)

190 Waterloo Road, Greenacre NSW

E24847.E02_Rev2
07 March 2025

Document Control

Report Title: Detailed Site Investigation (Updated Report) ,190 Waterloo Road, Greenacre NSW

Report Number: E24847.E02_Rev2

Copies		Recipient
1	Soft Copy (PDF – Secured, issued by email)	MMDA Pty Ltd 190 Waterloo Road, Greenacre NSW 2190 NSW 2190
2	Original (Saved to Digital Archives)	EI Australia Pty Ltd Suite 6.01, 55 Miller Street, Pyrmont NSW 2009

Author	Report Reviewer
	 
Louis Jacobs Environmental Engineer	**Warwick Hayes** Environmental Scientist EIANZ CEnvP 1401 Licenced Asbestos Assessor LAA00108

Revision	Details	Date	Amended By
0	Original	21 October 2020	-
1A-Draft	Revised for updates	12 February 2025	LJ / RL / WH
1	Updated with latest plans	4 March 2025	LJ / RL
2	Updated with latest plans	7 March 2025	LJ / RL

EXECUTIVE SUMMARY

MMDA Pty Ltd ('the client') engaged EI Australia (EI) to complete a detailed investigation of the land parcel located at 190 Waterloo Road, Greenacre NSW in New South Wales ('the site').

The site is located within the local government area of City of Canterbury Bankstown, and covers a total area of approximately 1800m^2. It is further identified as comprising Lot 21 in Deposited Plan (DP) 624967. At the time of completing this investigation, the property was being used as a fuel service station, with a car wash facility.

It was understood that the site was designated for mixed, commercial / residential redevelopment and that detailed (environmental / contamination) investigation was required in support of the corresponding application to City of Canterbury Bankstown Council. Such investigation was undertaken by EI in 2020 and this report updates the corresponding findings, taking into account current guidelines relevant to the assessment of contaminated sites.

The key findings of this DSI were as follows:

- The site had predominantly been used for commercial purposes since at least the 1950s, including operation as a fuel service station with car washing facility.
- The site and immediately neighbouring properties were free of statutory notices and licensing agreements issued under the *Contaminated Land Management Act 1997* and *Protection of the Environment Operations Act 1997*. The site was not included on the *List of NSW Contaminated Sites Notified to the EPA*.
- There was evidence that five underground storage tanks (USTs) were present on the site.
- Excluding any hardstand pavement, the sub-surface was comprised of a layer of anthropogenic, sandy clay filling (to 0.3-0.8 metre below ground level), overlying natural, residual clays, followed by weathered shale bedrock. Acid sulphate and/or saline soils were not expected to be present.
- Based on the standing water level data from 5 February 2025, the local groundwater table is intercepted at 3.85-4.30 metres below ground level.
- Site contamination appeared to be limited to petroleum hydrocarbons and asbestos-containing materials in localised areas. Future contamination delineation should target:
    - The UST farms and bowser areas;
    - The vicinity of borehole BH103 at the rear of the site, adjacent to the underground (waste) oil separator; and
    - The vicinity of borehole BH8 near the mid-west boundary.

Based on the findings of the completed investigations and with consideration of EI's *Statement of Limitations* (**Section 11**), it was concluded that widespread, or gross, contamination was not present at the site. However, in accordance with *State Environmental Planning Policy (Resilience and Hazards) 2021*, remediation were warranted under an approved action plan.

The site can be made suitable for the development subject to implementation of the recommendations provided in **Section 10** of this report. EI consider that the potential contamination would not preclude the proposed development and all additional works recommended in **Section 10** can be carried out as conditions of consent.

TABLE OF CONTENTS

Appendices

1. INTRODUCTION

1.1 Background and Purpose

MMDA Pty Ltd ('the client') engaged EI Australia (EI) to complete a detailed investigation of the land parcel located at 190 Waterloo Road, Greenacre NSW in New South Wales ('the site').

The site is located within the local government area (LGA) of City of Canterbury Bankstown (Council), and covers a total area of approximately 1800m^2 (**Figures 1** and **2**, **Appendix A**). It is further identified as comprising Lot 21 in Deposited Plan (DP) 624967. At the time of completing this investigation, the property was being used as a fuel service station, with a car wash facility.

It was understood that the site was designated for mixed, commercial / residential redevelopment and that detailed (environmental / contamination) investigation was required in support of the corresponding application to City of Canterbury Bankstown Council. Such investigation was undertaken by EI in 2020 and this report updates the corresponding findings, taking into account current guidelines relevant to the assessment of contaminated sites.

1.2 Proposed Development

The client has provided EI with the following documents to assist in preparing this updated DSI:

- Architectural Plans prepared by Ghazi Al Ali Architect Pty Ltd, Project Number 29.17, dated 28 February 2025.

The proposed redevelopment involved demolition of all existing site structures, followed by the construction of a seven-storey, mixed-use (commercial and residential apartment) complex, overlying a two-level basement facility. The building footprint would encompass the majority of the available area, with landscaped (retained soil) areas designated for the north-western and south-western portions. The finished floor level of the lower basement level was expected to be at 44.35 metres Australian Height Datum (m AHD), requiring bulk excavation to approximately 6m below ground level (BGL). Locally deeper excavations might be required for footings, lift overrun pits, crane pads and service trenches.

1.3 Project Objectives

The original objectives of the investigation were to:

- Establish the degree of any site contamination, by means of intrusive sampling and laboratory analysis for the contaminants of potential concern (COPC); and
- Make recommendations for the appropriate management of any contaminated soils and/or groundwater (if identified).

An additional objective for this updated report was to:

- Revise the document with reference to current (superseding) guidelines relevant to the assessment of contaminated sites.

1.4 Scope of Works

To achieve the above objectives, the following scope of works was completed:

2020 DSI Work Scope

- Review of relevant (hydro)geological and soil landscape maps for the project area;

- Searches of public registers maintained by the Environment Protection Authority of New South Wales (EPA) for statutory notices and licensing agreements issued under the *Contaminated Land Management Act 1997* and *Protection of the Environment Operations Act 1997* (re-searched 6 February 2025 for this updated report);
- A search of the *List of NSW Contaminated Sites Notified to the EPA* (re-searched 6 February 2025 for this updated report);
- A site walkover inspection (re-inspected 5 February 2025 for this updated report);
- A review of existing underground services on-site, completed with assistance from *Dial-Before-U-Dig* (DBYD) plans and electro-magnetic equipment;
- A review of the previous environmental (contamination assessment) report relating to the site, completed by EI in 2012, this assessment including the drilling of test boreholes at nine locations (BH1-BH9), distributed according to a triangular grid across accessible areas;
- Presentation of a conceptual site model (CSM);
- Preparation of a sampling, analytical and quality plan (SAQP);
- Drilling of test boreholes at seven locations (BH101-BH107), their distribution complementing the grid pattern established under the previous contamination assessment;
- Multiple level sampling within fill and natural soils at each of the bores; and
- Laboratory analysis of selected soil sample for the COPC.

2025 Updated Data Analysis and Reporting

This updated report documents all previous and current desk study findings, a revised CSM, data quality objectives (DQO), the soil sampling methodology and all analytical results. It also provides a record of observations made during the site walkover inspections, borehole and monitoring well construction logs and a discussion of the results in regards to potential risks to human health and the environment. It concludes with a statement concerning the suitability of the site for mixed, commercial and residential land use.

1.5 Regulatory Framework

The following regulatory framework and guidelines were considered during this DSI:

- *Contaminated Land Management Act 1997*;
- *Protection of the Environment Operations Act 1997*;
- *Environmental Planning and Assessment Act 1979*;
- *State Environment Protection Policy (Resilience and Hazards) 2021*;
- *Canterbury-Bankstown Local Environmental Plan 2023*;
- NEPC (2013) *National Environment Protection (Assessment of Site Contamination) Amendment Measure*;
- EPA (1995) *Sampling Design Guidelines*;
- EPA (2014) *Waste Classification Guidelines;*
- EPA (2017) *Guidelines for the NSW Site Auditor Scheme*;
- EPA (2020) *Consultants Reporting on Contaminated Land;* and
- EPA (2022a) *Sampling Design Part 1 - Application*.

2. SITE DESCRIPTION

2.1 Property Identification, Location and Physical Setting

The site identification details and associated information are presented in **Table 2-1**, while site locality and assessment area are illustrated in **Appendix A**, **Figures 1** and **2**.

Table 2-1 Site Identification

Attribute	Description
Street Address	190 Waterloo Road, Greenacre NSW
Site Coordinates	North east corner of the site (datum GDA94-MGA56): Easting: 320381.398 Northing: 6246542.641 (Source: http://maps.six.nsw.gov.au)
Site Area	1800m^2
Cadastral Identification	Lot 21 in DP 624967
LGA	City of Canterbury Bankstown
Parish	Bankstown
County	Cumberland
Current Zoning	B2: Local Centre (*Canterbury-Bankstown Local Environmental Plan 2023*)

2.2 Surrounding Land Use

The site is situated in a predominantly commercial area, as described in **Table 2-2**. The local sensitive receptors within close proximity to the site are also identified in this table.

Table 2-2 Surrounding Land Uses

Direction	Land Use Description	Sensitive Receptors
North	Commercial property, followed by community centre and car park facility	Notable areas surrounding the site were: ▪ Unnamed Creek (250m west to the site); ▪ Residential properties; ▪ Commercial land users; ▪ Development and maintenance workers; ▪ Pandora Pre-School (210m north east) and Toddlers Ink Childcare (300m south east).
East	Waterloo Road, followed by commercial properties	
South	Boronia Road, followed by commercial properties Residential properties south west	
West	Coles Supermarket, followed by residential properties	

2.3 Regional Setting

The topography, (hydro)geology and soil landscape information is summarised in **Table 2-3**.

Table 2-3 Regional Setting

Attribute	Description
Topography	The site is located within gently sloping terrain, the overall ground surface downslope being to the south west, the lowest point along Boronia Road. Its elevation was approximately 50m AHD.
Drainage	The land is predominantly paved and partially covered by buildings associated with an existing fuel service station, which formerly included a car wash facility. Drainage is expected to be routed directly to the local municipal stormwater system.
Geology	The site is underlain by Bringelly Shale, a formation of the Wianamatta Group. Bringelly Shale is comprised of carbonaceous claystone, laminate, fine to medium-grained lithic sandstone, rare coal (DMR, 1983).
Soil Landscape	The site lies within a Blacktown (residual) soil landscape. Natural soils are shallow to moderately deep (>1m), hard setting, mottled texture, yellow / red and brown, clay-dominated podzols, displaying low permeability (Chapman and Murphy, 1989).
Acid Sulfate Soil (ASS) Risk	The site is not classified on the *Bankstown Local Environmental Plan - ASS Map*. According to the 1:25,000 scale *Botany Bay Acid Sulfate Soil Risk Map* (Murphy, 1997), the site lies within an area having *No Known Occurrence* with respect to ASS. In such cases, ASS are not known or expected to occur and "land management activities are not likely to be affected by ASS materials". Based on the regional setting (elevation and map) findings, it was considered that the likelihood of ASS being present on the site was low and further ASS assessment was unwarranted.
Nearest Surface Water Feature	Unnamed creek, approximately 260m west of the site. This system is a moderately disturbed, freshwater feature.
Groundwater Flow Direction	Based on the nearest surface water feature and local topography, groundwater flow direction is anticipated to be (south) west towards the unnamed creek.

2.4 EPA Online Records

On 6 February 2025, an on-line search of the contaminated land public record maintained by the EPA was conducted. This search confirmed that the EPA had no regulatory involvement (i.e. notices) in relation to the area of investigation, nor for any properties in its proximity (<500m radius). The contaminated land public record is a searchable database of:

- Orders made under Part 3 of the *Contaminated Land Management Act 1997* (CLM Act);
- Approved voluntary management proposals under the CLM Act that have not been fully carried out and where the approval of the EPA has not been revoked;
- Site Audit Statements provided to the EPA under Section 53B of the CLM Act that relate to significantly contaminated land;
- Where practicable, copies of any documentation formerly required to be part of the public record; and
- Actions taken by the EPA under Sections 35 and 36 of the *Environmentally Hazardous Chemicals Act 1985*.

A search through the *List of NSW Contaminated Sites Notified to the EPA* under Section 60 of the CLM Act 1997 was also conducted. This list includes properties on which contamination has been identified, but is not deemed to be impacted significantly enough to warrant regulation. The site was not included on the list.

Note: Coles Supermarket Greenacre, located at 13-19 Boronia Road, Greenacre (50m west of the site), was notified to the EPA as being contaminated. EI considered this not a cause for concern because the land was hydraulically down-gradient and therefore any contamination was unlikely to migrate to the subject site. Further, the regional geology (clay and shale) would likely limit the migration of contamination.

A search of the *Protection of the Environment Operations (POEO) Act 1997* public register for environmental protection licences, applications, notices, audits, pollution studies and reduction programmes, was conducted on 6 February 2024. This search did not identify any record for the site and the properties in close proximity (<500m radius).

2.5 Site Walkover Inspections

Observations were recorded during walkover inspections of the site conducted on 22 September 2020 and 5 February 2025. These are summarised below. The site layout is shown on **Figure 2**. Refer also to photographs attached in **Appendix C**.

- The site layout and use were similar to that described by EI during the course of the 2012 assessment.
- At the time of the inspections, the site was occupied by a single storey, rendered brick building with a flat metal roof. The commercial operation was identified as “Fast & Easy”, consisting of a small retail store, fuel service station and a car wash. It was noted during February 2025 inspection that the car wash has ceased operation and is currently renovating into a juice bar.. A small food stand also exists along northern edge of site.
- The site was substantially covered either by concrete/bitumen hardstand or building footprints. The hardstand was in fair condition, with some cracking. A small area of bare ground (approximately 3m^2) was observed in the north-western corner of the property.
- Four fuel dispensers (bowsers) were present beneath a metal canopy within the centre eastern part of the site. A single dispenser (diesel) was in an uncovered area to the south of the retail building.
- Based on the number of metal fill points, at least four underground storage tanks (USTs) were near the centre and middle northern boundaries of the site. The fill points of the USTs were expected to overlying the USTs. An additional UST was present near the northern site boundary.
- An underground oil separator was found within the north-western portion of the site.
- Potential asbestos-containing materials (ACM) and lead-based paints were expected to be present on the buildings.

Three groundwater monitoring wells were identified during the inspection conducted on 5 February 2025 and since each contained a water column, standing water levels (SWL) were subsequently measured. Refer to **Appendix B, Figure 2** for the existing well locations. Refer to **Section 7.1** for the SWL data.

3. PREVIOUS REPORTING

The site was assessed for existing contamination in February - March 2012, the findings presented under the report (**Table 3-1**):

- EI (2012a) *Environmental Site Assessment; 190 Waterloo Road, Greenacre NSW* (EI Australia Report E1526.1 AA, dated 7 March 2012).

At the time of this investigation, the site was designated for residential (medium density apartment) use, the proposed redevelopment including bulk excavation for a basement facility. Refer to **Appendices A-D** for supporting information from the corresponding assessment report.

Table 3-1 Summary of Previous Site Assessment

Objective	To appraise the potential for site contamination, on the basis of field observations, historical land uses and other documentary evidence.
Findings	At the time of this investigation the site was found to be in use by *Liberty Service Station*. It was occupied by a single storey, rendered brick building with a flat metal roof. A metal awning was attached to the building, beneath which were several bowsers. The site remainder consisted largely of hardstand (concrete) pavements. Existing structures were in fair to good condition. Based on the available historical information, the site had continuously been used for commercial (service station) activities since the mid- to late 1950s, at least, with the initial operator being Ampol Petroleum Ltd. A search of WorkCover Authority records, dated 1982, indicated that the site contained five USTs. Based on the logs for nine test boreholes (identified as BH1-BH9), the soil profile across the site comprised up to 0.4m thickness of light brown/yellow, medium grained sand filling, overlying natural grey/brown clays of medium to high plasticity, grading into grey and yellow/orange/brown, weathered shale. Laboratory analytical results for representative soil samples revealed: ‣ Trace or slightly elevated concentrations of the screened heavy metals, although all concentrations complied with the adopted human health- and ecological- based criteria. ‣ Elevated concentrations of (C_6-C_9) petroleum hydrocarbons were identified in soils at location BH8, exceeding the adopted health-based investigation levels. ‣ Low or non-detectable concentrations of the screened phenols and polycyclic aromatic hydrocarbons (PAH) were identified, with all results well within the adopted criteria. ‣ No detectable concentration of any of the screened organochlorine and organophosphate pesticides (OCP and OPP), as well as all screened polychlorinated biphenyls (PCB), was identified in any of the tested soil samples, with all laboratory quantitation limits being within the adopted criteria. A groundwater monitoring well was installed in each of the bores BH1 (MW1), BH2 (MW2) and BH3 (MW3). Groundwater was not encountered in any of these wells (drilled to depths of up to approximately ten metres below ground level).
Conclusion and Recommendation	EI concluded that petroleum hydrocarbon-related contamination existed on the site, warranting further investigation and remediation. EI recommended that a remedial action plan (RAP) be drafted for the site. **Note:** A RAP was subsequently prepared under EI (2012b) *Remediation Action Plan; 190 Waterloo Road, Greenacre NSW* (EI Australia Report E1608.1 AA, dated 11 May 2012). The preferred remediation strategy involved excavation and off-site disposal of all UST infrastructure, as well as (impacted) soils, to licenced recycling and/or landfill facilities.

4. CONCEPTUAL SITE MODEL

In accordance with NEPC (2013) *Schedule B2 – Guideline on Site Characterisation*, EI developed a CSM as part of the contamination appraisal phase, assessing plausible linkages between potential contamination sources, migration pathways and receptors. The CSM provides a framework for identifying data gaps in the existing site characterisation.

4.1 Summary of Site History

Based on the available historical information, the site had continuously been used for commercial activities since at least the 1950s, including a petrol service station (with car wash facility). The surroundings included a range of commercial activities.

4.2 Predicted Subsurface Conditions

Based on the map information, walkover inspections and previous EI (2012a) assessment, the subsurface consisted of anthropogenic, sand-dominated filling (to 0.4m BGL), overlying natural (residual) clays, ultimately grading into weathered shale. Acid sulphate and/or saline soils were not expected to be present.

A cut and fill operation was unlikely to have occurred at the site, though the presence of imported fill needed to be considered, especially within the vicinities of the UST farms.

4.3 Potential Contamination Sources

The potential contamination sources were as follows:

- Commercial uses of the land (notably a petrol service station with car wash facility), dating back to the 1950s, at least;
- Imported fill soils of unknown origin and quality;
- Hazardous building materials, including ACM and lead-based paints, present within building structures;
- Leakage from vehicles; and
- Migration of mobile (liquid / vapour) contaminants from neighbouring, up-gradient, commercial premises.

4.4 Contaminants of Potential Concern

The COPC for the site were considered to be:

- Heavy Metals (HMs), including arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc;
- Total Recoverable Hydrocarbons (TRHs);
- Volatile Organic Compounds (VOCs); in particular
  - volatile chlorinated hydrocarbons (VCHs); and the
  - monocyclic aromatic hydrocarbons benzene, toluene, ethylbenzene, xylenes (BTEX);
- Polycyclic Aromatic Hydrocarbons (PAHs);
- Organochlorine and Organophosphorus Pesticides (OCPs / OPPs);
- Polychlorinated Biphenyls (PCBs);

- Phenols; and
- Asbestos.

Notes:
At the time of previous (2020) reporting, all other emerging (control order) chemicals recognised by the EPA in accordance with the *Environmentally Hazardous Chemicals Act 1985* were **not** considered to be COPCs for this site. It is acknowledged that per- and poly- fluoroalkyl substances (PFAS) should be considered for any future (data gap) investigation and/or validation program, especially given the on-site service station and car wash activities.
ASS and salinity parameters were **not** considered to be of relevance for this investigation.
The previous EI (2012a) assessment identified petroleum hydrocarbon-related (TRH and BTEX) contamination in some soil samples. Such contaminants were thus **of concern** to any future (data gap) investigation and/or validation program.

4.5 Identified Receptors

The following potential receptors of site contamination were identified:

- Existing and future site users / occupiers;
- On-site demolition, excavation and construction workers (during future redevelopment);
- Users of the adjacent land (during future redevelopment);
- Ecological receptors in areas of exposed soil / landscaping; and
- Local groundwater and surface runoff.

4.6 Risk Assessment

A summary of the CSM, with qualitative assessment of the potential contamination risks, is given in **Table 4-1**.

Table 4-1 Assessment of Potential Contamination Risk

Potential Source	Impacted Medium	COPC	Risk of Contamination
Commercial activities USTs Imported fill Leakage from vehicles	Soil Groundwater	HM, TRH, VOC, PAH, phenol, OCP, OPP, PCB, PFAS, asbestos	**Moderate to High** Imported fill present beneath concrete slabs (0.4m thickness)
Hazardous building materials	Soil	HM (lead in particular), asbestos	**Moderate to High** Buildings on-site likely to contain ACM and lead-based paints
Migration from off-site sources	Groundwater	HM, TRH, VOC, phenol	**Low to Moderate** Nearby properties include a range of commercial activities

Footnotes:
The overall potential for contamination to exist on the site was deemed to be high (indeed confirmed by EI (2012a)
Risks associated with all Source-Pathway-Receptor linkages considered to be moderate, noting site workers during demolition, excavation and construction, as well as future building / service maintenance, are assumed to use personal protective equipment (PPE), as per SafeWork NSW regulations; hence, eliminating S-P-R linkage
ASS and salinity parameters not considered to be of relevance for this investigation

Based on this CSM, which includes previous assessment soil data (EI, 2012a), petroleum hydrocarbon-related (TRH and BTEX) contamination **existed** on the site. The overall risk to the identified receptors was considered to be moderate.

5. METHODOLOGY

5.1 Sampling, Analytical and Quality Plan

The SAQP ensures that the data collected during environmental works are representative and provide a robust basis for assessment decisions. The SAQP for this detailed investigation included the following:

- Data quality objectives (DQO), restating the objectives of this DSI, then articulating the perceived goals of the sampling and analysis components, as well as the rationale behind their conception and means of their attainment;
- Data quality indicators (DQI), corresponding to the quality control measures integrated into the sampling and analysis components of the DSI;
- Sampling methodology, including description of the (intended) sampling points, the media sampled at each point and details of any in-field screening;
- Procedures for sample handling, preservation and storage;
- Identification of the required laboratory analyses; and
- Analytical quality assurance / quality control (QA/QC).

5.2 Data Quality Objectives

In accordance with the NEPC (2013) *Schedule B2 Guideline on Site Characterisation*, the USEPA (2006) *Data Quality Assessment* and EPA (2017) *Guidelines for the NSW Site Auditor Scheme*, DQO were developed by the EI investigation team, following the seven step, NEPC-/ EPA- process (**Table 5-1**). In doing so, the appropriate levels of data quantity and quality needed for the specific requirements of the project were established.

Table 5-1 Summary of Project Data Quality Objectives

DQO Step	Details
1. State the Problem Summarise the contamination problem that will require new environmental data	Site designated for mixed-use commercial/residential development (**Section 1.2**). Environmental investigation required as part of the application approval process. Based on the previous assessment and CSM, petroleum hydrocarbon-related contamination was present on-site, derived from previous use as a service station. The degree of site contamination was to be confirmed, by way of additional intrusive sampling and laboratory analysis for the COPC, thereby determining the land's suitability for the proposed development.
2. Identify the Goal of the Study (Identify the decisions) Identify the decisions that need to be made on the contamination problem	Based on the objectives outlined in **Section 1.3**, the decisions that need to be made were: ▪ Has the nature, extent and source of any soil and/or groundwater impacts onsite been defined? ▪ What impact do the site specific, geologic and hydrogeological conditions have on the fate and transport of any impacts that may be identified? ▪ Does the level of impact coupled with the fate and transport of identified contaminants represent an unacceptable risk to identified human and/or environmental receptors on or offsite? ▪ Does the collected data provide sufficient information to allow the suitability of the site to be determined, or selection and design of an appropriate remedial strategy, if necessary? ▪ If the data does not provide sufficient information, what data gaps require closure to enable the suitability of the site to be determined, or selection and design of an appropriate remedial strategy?
3. Identify Information Inputs (Identify inputs to decision) Identify the information needed to support any decision and specify the corresponding inputs	Inputs to the decision-making process included: ▪ Proposed development and land use; ▪ Review of the previous assessment at the site; ▪ National and EPA guidelines made or approved under the *NSW Contaminated Land Management Act 1997*; ▪ Visual observation and documentation (i.e. field notes, photographs) during site works; and ▪ Assessment of analytical results in relation to the adopted human health and ecological criteria. At the end of the DSI, a decision had to be made regarding the suitability of the site for the proposed development, or if additional investigation or remedial works were required to make the site suitable for the proposed use.
4. Define the Boundaries of the Study Specify the spatial and temporal aspects of the environmental investigation	Lateral – The cadastral boundaries of the site; Vertical – Investigations will be advanced to the depth of natural soils or rock; Temporal – The results will be valid on the day samples are collected and will remain valid as long as no changes occur in regards to site use, and contamination (if present) does not migrate onto the site from off-site sources.

DQO Step	Details
5. Develop the Analytic Approach (Develop a decision rule) Specify the decision rules that will provide a logical basis for choosing alternative actions	The decision rules for the investigation were: ▪ If the concentrations of contaminants in the soil exceed the adopted criteria, then assess the need to further investigate the extent of impacts onsite. ▪ Decision criteria for QA/QC measures are defined by the DQI in **Table 5-2**.
6. Specify Performance or Acceptance Criteria Specify the acceptable limits on decision errors, which are used to establish performance goals for limiting uncertainties in the data.	Specific limits for this project were in accordance with national and EPA guidance, and appropriate indicators of data quality and standard procedures for field sampling and handling. This included the following points to quantify tolerable limits: ▪ The null hypothesis for the investigation was that the mean concentration for each COPC exceeded the corresponding assessment (acceptance) criterion. ▪ The acceptance of the site as suitable for the proposed use was based on that: ‣ The concentration for each COPC complied with the corresponding criterion; but if not then ‣ The standard deviation of the results was less than 50% of the relevant acceptance criterion; and ‣ No single result exceeded the corresponding acceptance criterion by 250% or more. ▪ Hence, concentrations of COPC in soil that were below criteria made or approved by the EPA were treated as acceptable and indicative of suitability for the proposed land use(s). ▪ If contaminant concentrations in soil exceeded the adopted criteria, further investigation would be considered prudent. If no contamination is detected, no further action was required.
7. Develop the Detailed Plan for Obtaining Data Identify the most resource-effective (optimal) sampling and analysis design for the project and satisfy the DQOs	In order to identify the most resource-effective sampling and analysis design for general data that are expected to satisfy the DQO: ▪ Written instructions were issued to guide field personnel in the required fieldwork activities. ▪ Sampling was conducted at seven borehole locations (BH101-BH107), the distribution of these bores complementing the grid pattern established under the previous EI (2012a) contamination assessment. In combination, the minimum points recommended under the EPA (1995) *Sampling Design Guidelines* was achieved. ▪ An upper soil profile sample was collected at each borehole location and tested for the COPC, to assess the conditions of the fill/topsoil layer, and impacts from activities at ground level. ▪ Further discrete natural soil samples were analysed for COPC. Samples were selected based on field observations (including visual and olfactory evidence), whilst giving consideration to characterise the subsurface soil stratigraphy. ▪ In-field screening of soil headspace samples for VOC was carried out with a portable photo-ionisation detector (PID). ▪ Review of the results was undertaken to determine if further sampling was warranted (that being where soil concentrations were found to exceed the adopted criteria endorsed by the EPA, relevant to the proposed land use(s)).

5.3 Data Quality Indicators

To ensure that the investigation data were of an acceptable quality, they were assessed against the DQI outlined in **Table 5-2**, which related to both field and laboratory-based procedures. The overall assessment of data quality is presented in **Section 6**.

Table 5-2 Data Quality Indicators

QA/QC Component	Data Quality Indicator
Precision A quantitative measure of the variability (or reproducibility) of data	Data precision was assessed by reviewing the performance of blind field duplicate sample sets, through calculation of relative percentage differences (RPD). Data precision was deemed acceptable if RPDs were found to be less than 30%. RPDs that exceeded this range were considered acceptable where: ▪ Results were less than 10 times the limits of reporting (LOR); ▪ Results were less than 20 times the LOR and the RPD was<50%; or ▪ Heterogeneous materials or volatile compounds were encountered.
Accuracy A quantitative measure of the closeness of reported data to the “true” value	Data accuracy was assessed through the analysis of: ▪ Split field duplicate sample sets (RPDs as above); ▪ Field and method blanks, analysed for the analytes targeted in the primary samples; ▪ Matrix spike and matrix spike duplicate sample sets; and ▪ Laboratory control samples.
Representativeness The confidence (expressed qualitatively) that data are representative of each medium present onsite	To ensure the data produced by the laboratory were representative of conditions encountered in the field, the following measures were taken: ▪ Blank samples run in parallel with field samples, to confirm there were no unacceptable instances of laboratory artefacts; ▪ Review of RPDs for field and laboratory duplicates to provide an indication that the samples were generally homogeneous, with no unacceptable instances of significant sample matrix heterogeneities; and ▪ The appropriateness of collection methodologies, handling, storage and preservation techniques was assessed to ensure/confirm there was minimal opportunity for sample interference or degradation (i.e. volatile loss during transport due to incorrect preservation / transport methods).
Completeness A measure of the amount of useable data from a data collection activity	Analytical data sets acquired during the DSI were evaluated as complete upon confirmation that: ▪ Standard operating procedures (SOPs) for sampling protocols were adhered to; and ▪ Copies of all chain of custody (COC) documentation were included and found to be properly completed. It could therefore be considered whether the proportion of “useable data” generated in the data collection activities was sufficient for the purposes of the land use assessment.
Comparability The confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event	Given that several data sets from separate sampling episodes were required, issues of comparability were reduced through adherence to SOPs and regulator-endorsed or published guidelines and standards on each data gathering activity. In addition the data were collected by experienced samplers and NATA-accredited laboratory methodologies will be employed.

5.4 Sampling Rationale

With reference to the previous EI (2012a) assessment (**Section 3**) and updated CSM (**Section 4**), sampling works were planned in accordance with the following rationale:

- Drilling of boreholes at seven locations (BH101-BH107), the distribution of these bores complementing the grid pattern established under the previous EI (2012a) contamination assessment. In combination, the minimum points recommended under the EPA (1995) *Sampling Design Guidelines* for investigation of an area of 1800m^2 was achieved. Sampling of *in situ* fill and natural soils was conducted at six of the bores.
- Laboratory analysis of representative soil samples for COPC.

Notes:
Soil sampling was not conducted at BH101, this bore being drilled for soil profile determination only.
BH103 was located near the underground oil separator.
None of the existing groundwater monitoring wells contained a water column at the time of the 22 September 2020 field works, hence preventing assessment of local groundwater conditions (refer to **Appendix A, Figure 2** for the existing well locations).

5.5 Assessment Criteria

The sources for the assessment criteria adopted for this DSI are identified in **Table 5-3**. These were published guidelines that are endorsed by national or state regulatory authorities. The actual values were selected with due consideration of the exposure scenarios that are expected for various parts of the site, the likely exposure pathways, and the identified potential receptors. For the purposes of this DSI, the thresholds were termed *Soil Investigation Levels* (SILs).

Table 5-3 Adopted Investigation Levels for Soil

Adopted Guidelines	Rationale
NEPC (2013) HILs, HSLs, EILs/ESLs and Management Limits for TRH	**Soil Health-based Investigation Levels (HILs)** NEPC (2013) HIL-B thresholds for residential settings with minimal opportunities for soil access. **Soil Health-based Screening Levels (HSLs)** The NEPC (2013) HSL-D thresholds for commercial/industrial site use, to assess potential human health impacts from vapour intrusion of residual vapours of petroleum hydrocarbons, BTEX and naphthalene. **Ecological Investigation Levels (EILs) / Ecological Screening Levels (ESLs)** NEPC (2013) EILs/ESLs for urban residential and public open space land use scenarios will be adopted, to assess the potential impact to proposed landscaping areas, where plants could be exposed to soils and where precipitation may result in subsurface infiltration and resulting leaching of soil impacts to groundwater. The derived EILs were determined by the addition of site specific added contaminant limit and the ambient background concentration for a high traffic NSW suburb. The adopted ESL criteria were coarse grained criteria, as a conservative approach. **Management Limits for Petroleum Hydrocarbons** Where the HSLs and ESLs for petroleum hydrocarbons were exceeded, sample results were also assessed against the NEPC (2013) *Management Limits* for the F1-F4 TRH fractions, to assess propensity for phase-separated hydrocarbons (PSH), fire and explosive hazards and adverse effects on buried infrastructure.

5.6 Soil Sampling

The soil sampling works conducted for the DSI are described in **Table 5-4**. Sampling locations are illustrated in **Figure 2** (**Appendix A**).

Table 5-4 Summary of Soil Sampling Methodology

Activity	Details
Fieldwork	Intrusive borehole drilling and soil sampling were conducted on 22 September 2020, A total of seven boreholes (BH101-BH107) were drilled for the DSI.
Method	All test bores were drilled using a ute-mounted rig, fitted with solid flight augers. Borehole details are presented in the detailed logs, attached in **Appendix D**.
Soil Logging	Drilled soils were described in-field with respect to lithological characteristics and evaluated on a qualitative basis for odour and visual signs of contamination. Soil descriptions were based on Australian Standard (AS) 1726-2017. Sample descriptions are included in the borehole logs, presented in **Appendix D**.
Soil Sampling	Soil samples were collected by dry grab method (the sampler wearing unused, dedicated nitrile gloves) and placed into laboratory-supplied, glass jars, or snap-lock, plastic bags, the latter being used for the asbestos and soil headspace (VOC) screening samples. Blind and split field duplicates were separated from the primary samples and placed into dedicated glass jars.
Soil Vapour Screening	Screening for VOC was performed in-field using a calibrated, portable PID, fitted with a 10.9eV lamp (**Appendix E**).
Decontamination Procedures	Nitrile sampling gloves were replaced between each sampling location. Samples were collected from a different part of the solid flight auger and the auger was cleaned from all residual soil waste between each borehole location.
Management of Soil Cuttings	Soil cuttings were used as backfill for completed boreholes.
Sample Preservation and Transport	Samples were stored in an insulated chest (containing ice packs), whilst on-site and in transit to the contracted laboratories. Soil samples were transported to SGS Environmental Services (SGS; the primary laboratory) under strict chain-of-custody (COC) conditions. Signed COC certificates and sample receipt advice (SRA) were provided by SGS for confirmation purposes (**Appendix F**). A split (inter-laboratory) soil field duplicate was submitted to Envirolab Services Pty Ltd (Envirolab; the secondary laboratory) under strict COC conditions. Signed COC forms and SRA were provided by Envirolab for confirmation purposes (**Appendix F**).
Laboratory Analysis and Quality Control	Soil samples were analysed by SGS and Envirolab for the COPC. All samples were analysed within the required holding period, as documented in the corresponding laboratory reports (**Appendix G**). In addition to the split (inter-laboratory) field duplicate (BH100_QT1; analysed by Envirolab), QC testing comprised one blind (intra-laboratory) field duplicate (BH100_QD1), an equipment rinsate blank, a laboratory-prepared, trip spike soil sample and a laboratory-prepared, trip blank soil sample, all analysed by SGS.

6. DATA QUALITY ASSESSMENT

The assessment of data quality is defined as the scientific and statistical evaluation of environmental results to determine if they meet the objectives of the project (USEPA, 2006). For this DSI, data quality assessment involved an evaluation of the compliance of the field (sampling) and laboratory procedures with established protocols, as well as the accuracy and precision of the associated results from the quality control measures. The findings are summarised in **Table 6-1** and discussed in more detail in **Appendix H**.

In summary, the overall quality of the analytical data from this DSI was considered to be of an acceptable standard for interpretive use and preparation of an updated CSM.

Table 6-1 Quality Assurance Process

Stage	Control	Conformance [Yes, Part, No]	Report Section(s)
Preliminaries	DQO and DQI established	Yes	**Section 5**
Field Work	Suitable documentation of fieldwork, including borehole logs, field notes	Yes	**Appendices D, E** and **F**
Sampling Plan	Use of relevant and appropriate SAQP	Yes	**Section 5**
	All media sampled and duplicates collected	Yes	**Appendices B** and **D**
	Use of appropriate sampling methods	Yes	**Section 5.6**
	Selection of soil samples according to field PID readings (where VOCs are present)	Yes	**Section 7**
	Preservation and storage of samples upon collection and during transport to laboratory	Yes	**Section 5.6**
	Appropriate field rinsate, duplicate and trip blank /spike samples taken	Yes	**Appendix H**
	Completed field and analytical laboratory sample COC procedures and documentation	Yes	**Appendices F** and **G**
Laboratory	Sample holding times within acceptable limits	Yes	**Appendices H** and **I**
	Use of appropriate analytical procedures and NATA-accredited laboratories	Yes	**Appendices H** and **I**
	LORs low enough to meet adopted criteria	Yes	**Appendices H** and **I**
	Laboratory blanks	Yes	**Appendices H** and **I**
	Laboratory duplicates	Yes	**Appendices H** and **I**
	Matrix spikes	Yes	**Appendices H** and **I**
	Surrogates	Yes	**Appendices H** and **I**
	Analytical results for replicate samples expressed as RPD	Yes	**Appendices H** and **I**
	Checking for the occurrence of apparently unusual or anomalous results (e.g. laboratory results that appear inconsistent with field observations)	Yes	**Appendices B**, **G** and **I**
Reporting	Report reviewed by senior staff	Yes	**Report Distribution**

7. RESULTS

7.1 Field Results

Field Observations

During drilling, soil samples were collected from BH102-BH107 at various depths ranging between 0-4m BGL. All examined soils were assessed for odour and signs of contamination (e.g. staining, colour, inclusions or asbestos fragments) and the following observations were noted:

- No visual or olfactory evidence of contamination was detected at any of the sampling locations, nor in any of the examined (drilled) soils.
- Low PID readings were recorded for the in-field, soil headspace samples (<10 ppm). This was consistent with the non-detection of any suspicious odour in the examined soils.
- Foreign materials such as ash and slag, as well as fragments of brick, metals, glass and fibre cement sheeting (FCS) were not observed in any of the examined soils. Some sub-angular to angular gravels were identified, however.

Sub-Surface Conditions

Based on the combined EI (2012a) and 2020 borehole logs (**Appendix D**), and excluding any hardstand pavement, the site lithology was generalised as a layer of anthropogenic, sandy clay filling (to 0.3-0.8m BGL), overlying residual clays, followed by weathered shale bedrock. Further details are provided in **Table 7-1**.

Table 7-1 Generalised Sub-Surface Profile

Layer	Description	Minimum and Maximum Depth (m BGL)
Fill	Sandy CLAY; low plasticity, pale brown, some fine grained sand and sub-angular to angular gravels	0-0.8
Residual Soil	Silty CLAY; medium to high plasticity, pale grey-orange	0.3-3.6
Bedrock	SHALE; dark brown, extremely weathered	1.6-4+

Groundwater

None of the existing groundwater monitoring wells contained a water column at the time of the 22 September 2020 field works, hence preventing assessment of local groundwater conditions (refer to **Appendix A, Figure 2** for the existing well locations). However, SWL and PID data were obtained during the site walkover inspection conducted on 5 February 2025. Observations were:

- No suspicious (i.e. petroleum hydrocarbon) odour was detected in any of the wells.
- PID readings within the upper casing of all three monitoring wells were negligible (<1 ppm).
- The SWL measurements were 3.85m BGL (BH1 / MW1), 4.30m BGL (GW1X; assumed replacement of original EI (2012a) BH2 / MW2 well) and 4.20m BGL (BH3 / MW3).

7.2 Laboratory Analytical Results

A summary of the laboratory results for the representative soil samples from BH102-BH107 is presented in **Table 7-2**.

Table 7-2 Summary of Soil Analytical Results (BH102-BH107)

Number of Primary Samples	Analyte	Minimum Concentration (mg/kg)	Maximum Concentration (mg/kg)	Samples Exceeding SILs
Heavy Metals (total)				
14	Lead	1	110	None
PAH				
6	Naphthalene	<0.1	1.4	None
6	Benzo(a)pyrene	<0.1	1.3	None
6	Carcinogenic PAH (as B(α)P TEQ)	<0.3	3.1	None
6	Total PAH	<0.8	23	None
BTEX				
14	Benzene	<0.1	<0.1	None
14	Toluene	<0.1	<0.1	None
14	Ethyl benzene	<0.1	<0.1	None
14	Total Xylenes	<0.3	<0.3	None
TRH				
14	F1	<25	<25	None
14	F2	<25	<25	None
14	F3	<90	340	BH103_0.3-0.4
14	F4	<120	160	None
Asbestos				
6	Asbestos	Not Detected	Detected	BH103_0.3-0.4

More detailed tabulation of the results, showing the concentrations for individual samples alongside the adopted soil criteria, is presented in **Appendix B**, **Table 1**. This table includes the sample data from the EI (2012a) contamination assessment, which are hereby re-evaluated according to the currently accepted acceptance criteria.

8. SITE CHARACTERISATION

8.1 Subsurface Conditions

The site lithology was generalised as a layer of anthropogenic, sandy clay filling, overlying natural, residual clays, grading into weathered shale. Acid sulphate and/or saline soils were not expected to be present.

The depth of fill soils ranged from 0.3m BGL in the eastern portion (BH101), to 0.8m BGL at the western boundary. Additional fill should be expected in and immediately around the UST pits.

Based on the SWL data from 5 February 2025, the local groundwater table is intercepted at 3.85-4.30m BGL.

8.2 Soil Impact

Analytical results for the representative fill and natural soil samples from the DSI all complied with the adopted SILs applicable to residential land use settings with minimal soil access, except as follows:

- C_{16}-C_{34} (F3) TRHs in sample BH103_0.3-0.4 (340 mg/kg); and
- The presence of chrysotile and crocidolite asbestos (both as small fibre bundles and bonded fragments) in sample BH103_0.3-0.4 (>0.01 %w/w).

BH103 was within an unsealed grassed area at the rear of the site, adjacent to the underground (waste) oil separator.

The previous EI (2012a) contamination assessment identified elevated concentrations of benzene (in fill) and C_6-C_9 petroleum hydrocarbons (in natural soil) at location BH8. The reported concentrations marginally exceeded adopted (current) health-based criteria. The identified TRH contamination warranted lateral and vertical delineation, targeting the borehole locations BH103M and BH8. The UST farms (including bowsers) would need representative sampling and testing post infrastructure removal, which will be performed as part of the bulk excavation stage under the proposed redevelopment.

The identified asbestos contamination warranted lateral and vertical delineation, targeting the borehole location BH103.

8.3 Review of Conceptual Site Model

On the basis of the combined investigation findings, the CSM discussed in **Section 4** was considered to appropriately identify contamination sources, migration mechanisms and exposure pathways, as well as potential on-site and off-site receptors. This model postulated that there was potential for site contamination. The subsequent sampling and analyses supported this hypothesis, indeed existing contamination was identified.

Gross or widespread soil contamination did not seem to be present at the site, however. Rather, the identified impacts were probably limited to petroleum hydrocarbons and ACM in localised areas. Future contamination delineation should thus target (**Figure 2**, **Appendix A**):

- The UST farms and bowser areas;
- The vicinity of borehole BH103 at the rear of the site, adjacent to the underground (waste) oil separator; and
- The vicinity of borehole BH8 near the mid-west boundary.

Site remediation is needed in order to render the site suitable for the proposed development, in accordance with the *Contaminated Land Management Act 1997* and *State Environmental Planning Policy (Resilience and Hazards) 2021*. Under the proposed development (**Section 1.2** and **Appendix B**), excavation of site soils will be conducted, in order to construct the basement. Hence, the most likely remediation strategy is off-site disposal of UPSS infrastructure and contaminated soils to EPA-licensed recycling and landfill facilities. The works can be integrated into the basement excavation and construction stages of the proposed development (i.e. post demolition). The waste classification process will require representative soil sampling and analysis of the COPCs listed in **Section 4.4**, in accordance with the EPA (2014) *Waste Classification Guidelines*. The available investigation data can be utilised for this purpose.

Local groundwater quality has yet to be determined. A groundwater monitoring event (GME) is recommended, prior to building demolition works, utilising the existing on-site wells. Representative groundwater samples are to be analysed for dissolved heavy metals, TRH, VOC (including VCH and BTEX), PAH, phenols and PFAS, at least.

9. CONCLUSION

190 Waterloo Road, Greenacre in New South Wales was the subject of this detailed investigation, conducted in order to establish the nature and degree of any on-site contamination and thereby assess its suitability for proposed mixed, commercial / residential redevelopment.

The key findings of this DSI were as follows:

- The site had predominantly been used for commercial purposes since at least the 1950s, including operation as a fuel service station with car wash facility.
- The site and immediately neighbouring properties were free of statutory notices and licensing agreements issued under the *Contaminated Land Management Act 1997* and *Protection of the Environment Operations Act 1997*. The site was not included on the *List of NSW Contaminated Sites Notified to the EPA*.
- There was evidence that five USTs were present on the site.
- Excluding any hardstand pavement, the sub-surface was comprised of a layer of anthropogenic, sandy clay filling (to 0.3-0.8 metre below ground level), overlying natural, residual clays, followed by weathered shale bedrock. Acid sulphate and/or saline soils were not expected to be present.
- Based on the standing water level data from 5 February 2025, the local groundwater table is intercepted at 3.85-4.30 metres below ground level.
- Site contamination appeared to be limited to petroleum hydrocarbons and ACM in localised areas. Future contamination delineation should target:
    - The UST farms and bowser areas;
    - The vicinity of borehole BH103 at the rear of the site, adjacent to the underground (waste) oil separator; and
    - The vicinity of borehole BH8 near the mid-west boundary.

Based on the findings of the completed investigations and with consideration of EI's *Statement of Limitations* (**Section 11**), it was concluded that widespread, or gross, contamination was not present at the site. However, in accordance with *State Environmental Planning Policy (Resilience and Hazards) 2021*, remediation were warranted under an approved action plan.

The site can be made suitable for the proposed redevelopment subject to implementation of the recommendations provided in **Section 10**. EI consider that the potential contamination would not preclude the proposed development (**Section 1.2**) and all additional works recommended in **Section 10** can be carried out as conditions of consent.

10. RECOMMENDATIONS

EI makes the following recommendations, which are to be completed prior to building demolition:

- A GME is to be completed, utilising the existing on-site wells. Representative groundwater samples are to be analysed for dissolved heavy metals, TRH, VOC (including VCH and BTEX), PAH, phenols and PFAS, at least.
- A hazardous materials survey (HMS) should be conducted by a suitably qualified consultant, to identify all hazardous materials present within the existing building fabrics.
  - All identified hazardous materials on the site must be appropriately managed during the demolition and land clearance works, to maintain worker health and safety and prevent the spread of related contaminants.
  - An asbestos clearance inspection and certificate should be completed by a suitably qualified professional (SafeWork NSW Licensed Asbestos Assessor) following the removal of all ACM (if present).
  - Where clearance inspection indicates hazardous materials remain on the site, further removal and re-clearance inspection, must be undertaken.
- A remediation action plan (RAP) is to be prepared, which will include a SAQP for the delineation of the vertical and lateral extents of all TRH and ACM contamination. The RAP is to include methodology for the removal and validation of UPSS infrastructure.
  - Under the proposed development (**Section 1.2** and **Appendix B**), excavation of soils will be conducted, in order to construct the basement. Hence, the most likely remediation strategy is off-site disposal of UPSS infrastructure and contaminated soils to EPA-licensed recycling and landfill facilities. The works can be integrated into the basement excavation and construction stages of the proposed development.

EI provides the following recommendations in relation to the proposed development, which are to be completed post building / pavement demolition:

- Following building / pavement demolition and removal of associated wastes, an inspection of the exposed surface should be performed by a suitably qualified environmental consultant. This inspection is to coincide with asbestos clearance reporting.
- Undertake remediation and validation works for the site, as outlined in the RAP.
- All soil materials designated for off-site disposal, including any *virgin excavated natural material* (VENM), must be pre-classified in accordance the EPA (2014) *Waste Classification Guidelines*. In designing the SAQP for waste classification, the EPA (2022a) *Sampling Design Part 1 - Application* guidelines should also be referred to and the analytical suite is to include the identified COPCs listed in **Section 4.4**. The available investigation data can be utilised for this purpose.
- Once appropriately classified, all waste materials are to be transported to EPA-licensed waste facilities by the appointed waste contractors. All tipping dockets supplied by the landfill companies are to be retained, to confirm the appropriate (lawful) disposal of wastes.
- Any material being imported to the site should be validated as suitable for the intended land use, in accordance with EPA guidelines. In particular, imported filling / landscaping material must be certified as meeting the VENM classification, prior to importation.

EI emphasises that these recommendations can be managed through the development approval process, in accordance with *State Environmental Planning Policy (Resilience and Hazards) 2021*.

11. STATEMENT OF LIMITATIONS

This report has been prepared for the exclusive use of MMDA Pty Ltd, whom is the only intended beneficiary of EI's work. The scope of the investigation carried out for the purpose of this report was limited to that agreed with MMDA Pty Ltd.

No other party should rely on this document without the prior written consent of EI, and EI undertakes no duty, or accepts any responsibility or liability, to any third party who purports to rely upon this document without EI's approval.

The findings presented in this report are the result of discrete and specific sampling methodologies used in accordance with best industry practices and standards. Due to the site-specific nature of soil sampling from point locations, it is considered likely that all variations in subsurface conditions across a site cannot be fully defined, no matter how comprehensive the field program.

While normal assessments of data reliability have been made, EI assumes no responsibility or liability for errors in any data obtained from previous assessments conducted on site, regulatory agencies (e.g. Council, EPA), statements from sources outside of EI, or developments resulting from situations outside the scope of works of this project.

Despite all reasonable care and diligence, the ground conditions encountered and concentrations of contaminants measured may not be representative of conditions between the locations sampled and investigated. In addition, site characteristics may change at any time in response to variations in natural conditions, chemical reactions and other events (e.g. groundwater movement and or spillages of contaminating substances). These changes may occur subsequent to EI's investigation.

EI's assessment is necessarily based upon the results of the site investigation and the restricted program of surface and subsurface sampling, screening and chemical testing which was set out in the project proposal. Neither EI, nor any other reputable consultant, can provide unqualified warranties nor does EI assume any liability for site conditions not observed or accessible during the time of the investigations.

This report was prepared for MMDA Pty Ltd and no responsibility is accepted for use of any part of this report in any other context or for any other purpose or by other third parties. This report does not purport to provide legal advice.

This report and associated documents remain the property of EI subject to payment of all fees due for this assessment. The report shall not be reproduced except in full and with prior written permission by EI.

REFERENCES

Ahern CR, Stone Y and Blunden B (1998) *Acid Sulfate Soils Assessment Guidelines*, part of the *Acid Sulfate Soil Manual*, Acid Sulfate Soil Management Advisory Committee (ASSMAC), Wollongbar, NSW, Australia, 28 August 1998.

Chapman GA and Murphy CL (1989) *Soil Landscapes of the Sydney 1:100 000 Sheet*, Soil Conservation Service of NSW, Sydney, September 1989.

CRC CARE (2017) *Risk-Based Management and Remediation Guidance for Benzo(a)pyrene*, CRC CARE Technical Report No.39, CRC for Contamination Assessment and Remediation of the Environment, Newcastle, Australia, January 2017.

DMR (1983) *Sydney 1:100,000 Geological Series Sheet 9130*, Geological Survey of New South Wales, Department of Mineral Resources, 1983.

DPIE (2020) *eSPADE v2.0 Portal*. NSW Department of Planning, Industry and Environment (retrieved from www.espade.environment.nsw.gov.au).

DUAP/EPA (1998) *Managing Land Contamination. Planning Guidelines SEPP 55 - Remediation of Land*. New South Wales Department of Urban Affairs and Planning / Environment Protection Authority, August 1998.

EI (2012a) *Environmental Site Assessment; 190 Waterloo Road, Greenacre NSW*, EI Australia Report E1536.1 AA, 7 March 2012.

EI (2012b) *Remediation Action Plan; 190 Waterloo Road, Greenacre NSW*, EI Australia Report E1608.1 AA, 11 May 2012.

EnHealth (2005) *Management of Asbestos in the Non-Occupational Environment*, Department of Health and Ageing, Canberra, Australia.

Enrisk (2016) *Proposed Decision Tree for Prioritising Sites Potentially Contaminated with PFASs*, Environmental Risk Services Pty Ltd, Environment Protection Authority of New South Wales, 25 February 2016.

EPA (1995) *Sampling Design Guidelines*, Contaminated Sites Unit, Environment Protection Authority of New South Wales, EPA 95/59, September 1995.

EPA (2014) *Waste Classification Guidelines – Part 1: Classifying Waste*, Environment Protection Authority of New South Wales, EPA 2014/0796, November 2014.

EPA (2017) *Guidelines for the NSW Site Auditor Scheme: Contaminated Land Guidelines* (Third Edition), Environment Protection Authority of New South Wales, EPAP0269, October 2017.

EPA (2020) *Consultants Reporting on Contaminated Land: Contaminated Land Guidelines*, Environment Protection Authority of New South Wales, EPA 2020P2233, April 2020.

EPA (2022a) *Sampling Design Part 1 - Application: Contaminated Land Guidelines*, Environment Protection Authority of New South Wales, EPA 2022P3915, August 2022.

EPA (2022b) *Sampling Design Part 2 – Interpretation: Contaminated Land Guidelines*, Environment Protection Authority of New South Wales, EPA 2022P3916, August 2022.

HEPA (2020) *PFAS National Environmental Management Plan Version 2.0*, Heads of EPAs Australia and New Zealand (HEPA), National Chemicals Working Group, January 2020.

Imray P and Neville G (1993) *Approaches to the Assessment and Management of Asbestos-Contaminated Soil.* From the *Second National Workshop on the Health Risk Assessment and Management of Contaminated Sites (1993).*

Murphy CL (1997) *Acid Sulfate Soil Risk of the Botany Bay Sheet* (Second Edition). Department of Land and Water Conservation, Sydney (supplied by the Sydney South Coast, Geographical Information Systems Unit).

NEMP (2020) *PFAS National Environmental Management Plan*, National Chemicals Working Group of the Heads of the EPAs Australia and New Zealand (HEPA), January 2020.

NEPC (1999) *National Environmental Protection (Assessment of Site Contamination) Measure 1999*. National Environmental Protection Council, December 1999.

NEPC (2013) *National Environment Protection (Assessment of Site Contamination) Amendment Measure*, National Environment Protection Council, April 2013.

Standards Australia (2005) *Table E1 - Minimum Sampling Points Required for Site Characterisation*, in *Australian Standard AS4482.1-2005 Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil - Part 1: Non-volatile and Semi-volatile Compounds*, Standards Australia 2005.

Standards Australia (2017) *Geotechnical Site Investigations*, Australian Standard AS1726:2017, Standards Australia 2017.

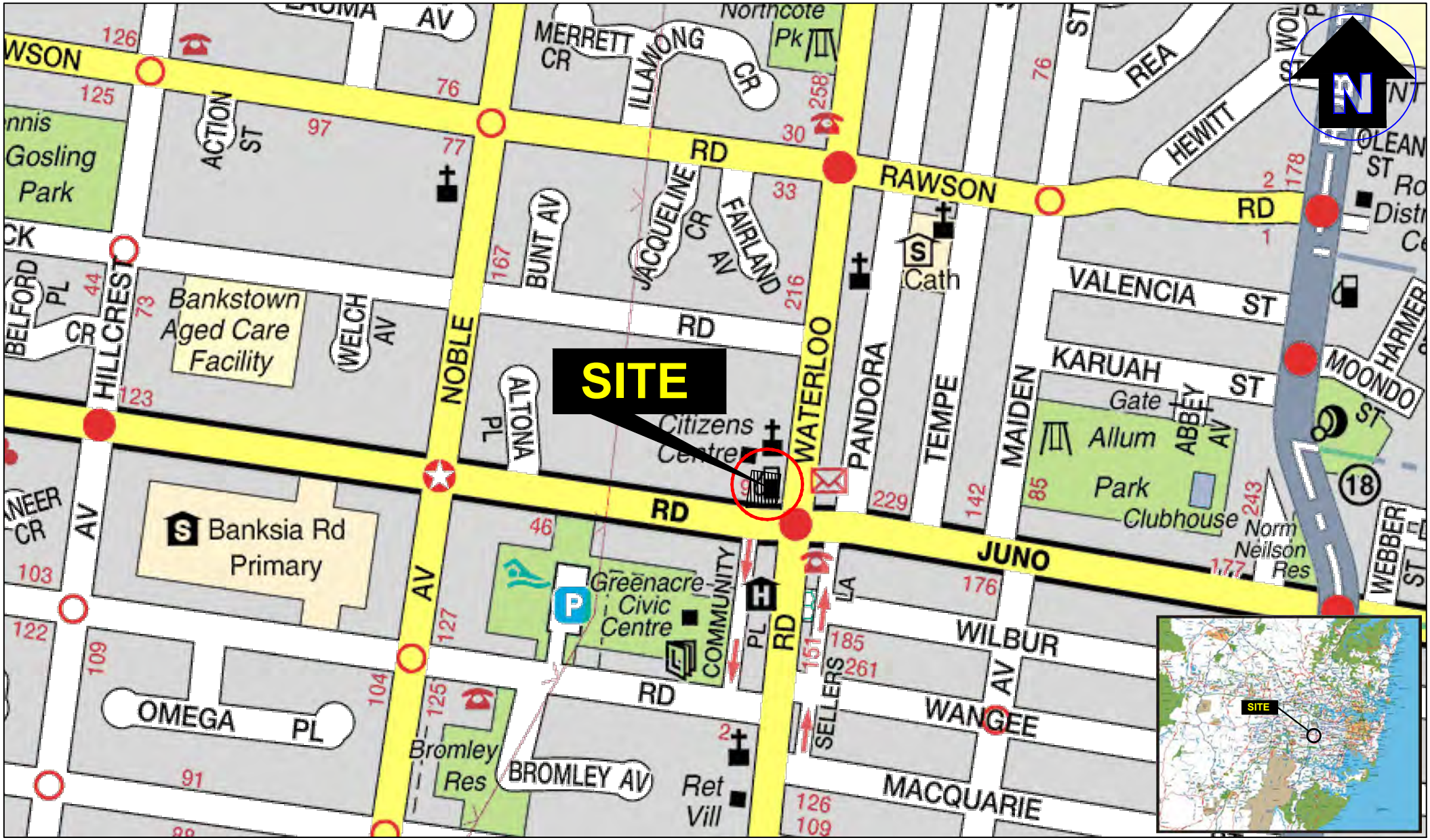
USEPA (2000a) *Guidance for the Data Quality Objectives Process - EPA QA/G-4*, United States Environmental Protection Agency, EPA/600/R-96/055, August 2000.

USEPA (2000b) *Data Quality Objectives Process for Hazardous Waste Site Investigations - EPA QA/G-4HW*, United States Environmental Protection Agency, EPA/600/R-00/007, January 2000.

USEPA (2006) *Data Quality Assessment: A Reviewers Guide - EPA QA/G-9R. USEPA Office of Environmental Information*, EPA/240/B-06/002, February 2006.

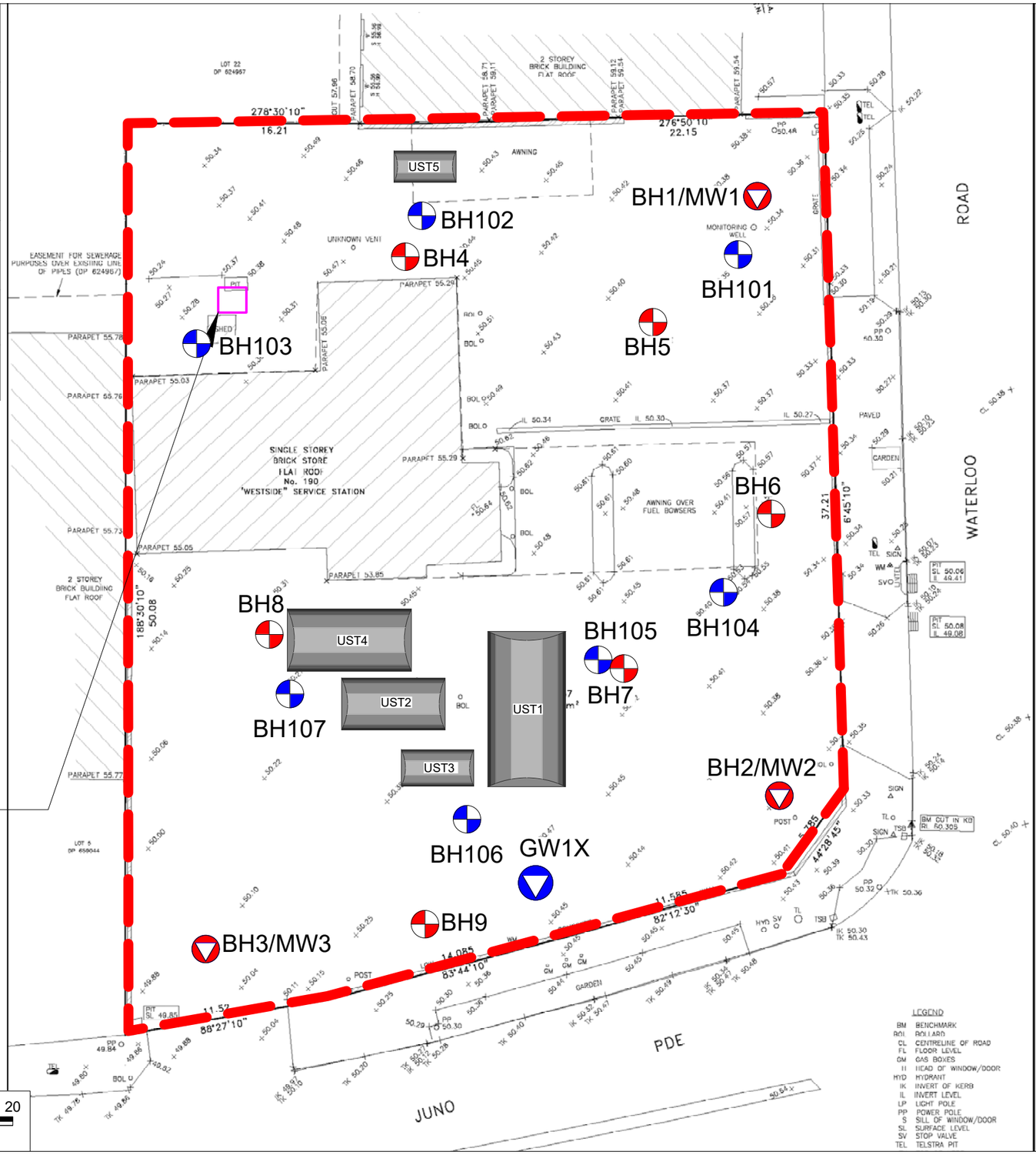
WADOH (2009) *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia,* Published by the Western Australian Department of Health, May 2009.

Appendix A – Figures



eiaustralia Contamination | Remediation | Geotechnical Suite 6.01, 55 Miller Street, PYRMONT 2009 Ph (02) 9516 0722 Fax (02) 9518 5088	Drawn:	AM.H.	**MMDA Pty Ltd** Detailed Site Investigation 190 Waterloo Road, Greenacre NSW Site Locality Plan
	Approved:	S.L.	Figure: 1
	Date:	28-09-20	
	Scale:	Not To Scale	Project: E24847.E02

UST ID	Stored Product	Capacity
UST1	Unleaded Petrol	55000L
UST2	Unleaded Petrol	17000L
UST3	Premium Unleaded	9000L
UST4	Diesel	17000
UST5	Kerosene	2200L



0 5 10 20
Approx. Scale (m)

Map Source: Survey Plan, unreferenced

LEGEND

- Approximate site boundary
- Approximate borehole location - current investigation
- Approximate UST location
- Approximate previous borehole location - ESA (EI, 2012)
- Approximate previous monitoring well location - ESA (EI, 2012)
- Approximate existing monitoring well location - (details unknown)

eiaustralia
Contamination | Remediation | Geotechnical
Suite 6.01, 55 Miller Street, PYRMONT 2009
Ph (02) 9516 0722 Fax (02) 9518 5088

Drawn:	M.O.
Approved:	R.L.
Date:	11-02-25

MMDA Pty Ltd
Detailed Site Investigation
90 Waterloo Road, Greenacre NSW
Sampling Location Plan

Figure: 2

Project: E24847.E02

Appendix B – Analytical Result Tables

Table T1 - Summary of Soil Analytical results

Sample ID	Material	Heavy Metals								PAHs				BTEX				TRH /TPH				Phenols	VOCs					Asbestos
		As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	Carcinogenic PAHs (as B(a)P TEQ)	Benzo(a)pyrene	Total PAHs	Naphthalene	Benzene	Toluene	Ethylbenzene	Total Xylenes						Isopropylbenzene (Cumene)	n-propylbenzene	1,3,5-trimethylbenzene	1,2,4-trimethylbenzene	Other VOCs	Presence / Absence
Previous Investigation - ESA (EI, 2012)																												
																		C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}							
BH1-1	Fill	7	<0.3	14	21	19	<0.05	11	64	NA	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<20	<20	<50	<50	0.2	<0.1	<0.1	<0.1	<0.1	ND	NA
BH1-2	Natural	<3	<0.3	10	38	14	<0.05	13	88	NA	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<20	<20	<50	<50	0.1	N.A.	N.A.	N.A.	N.A.	ND	NA
BH2-1	Fill	6	0.4	16	21	23	<0.05	15	78	NA	<0.1	<0.8	<0.1	0.1	0.2	0.3	0.7	<20	<20	<50	<50	0.3	<0.1	<0.1	<0.1	0.2	ND	NA
BH2-2	Natural	5	<0.3	14	25	19	<0.05	7.6	55	NA	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<20	<20	<50	<50	0.1	N.A.	N.A.	N.A.	N.A.	ND	NA
BH3-1	Fill	<3	<0.3	11	19	16	<0.05	15	66	NA	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<20	<20	<50	<50	0.3	<0.1	<0.1	<0.1	<0.1	ND	NA
BH3-2	Natural	<3	<0.3	11	25	13	<0.05	5.8	40	NA	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<20	<20	<50	<50	0.1	N.A.	N.A.	N.A.	N.A.	ND	NA
BH4-1	Fill	8	<0.3	10	12	28	<0.05	6	31	NA	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<20	<20	<50	<50	1.4	<0.1	<0.1	<0.1	<0.1	ND	NA
BH4-2	Natural	17	<0.3	12	20	16	<0.05	6.7	37	NA	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<20	<20	<50	<50	0.2	N.A.	N.A.	N.A.	N.A.	ND	NA
BH5-1	Fill	17	<0.3	10	15	16	<0.05	7.2	29	NA	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<20	<20	<50	<50	0.2	<0.1	<0.1	<0.1	<0.1	ND	NA
BH5-2	Natural	17	<0.3	9.4	21	14	<0.05	3.5	22	NA	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<20	<20	<50	<50	0.4	N.A.	N.A.	N.A.	N.A.	ND	NA
BH6-1	Fill	7	<0.6	10	19	15	<0.05	8.4	33	NA	<0.1	<0.8	0.2	0.2	<0.1	0.1	2.1	<20	<20	<50	<50	2.3	0.2	0.5	0.1	0.4	ND	NA
BH6-2	Natural	8	0.3	14	41	21	<0.05	15	72	NA	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<20	<20	<50	<50	0.5	N.A.	N.A.	N.A.	N.A.	ND	NA
BH6-3	Natural	4	0.4	9.4	28	14	0.08	23	86	NA	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<20	<20	<50	<50	<0.1	N.A.	N.A.	N.A.	N.A.	ND	NA
BH7-1	Fill	4	<0.3	9.7	18	19	<0.05	8.3	50	NA	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<20	<20	<50	<50	1.2	<0.1	<0.1	<0.1	<0.1	ND	NA
BH7-2	Natural	5	<0.3	12	36	13	<0.05	14	83	NA	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<20	<20	<50	<50	0.2	N.A.	N.A.	N.A.	N.A.	ND	NA
BH8-1	Fill	5	<0.3	8.5	11	13	<0.05	4.7	89	NA	<0.1	<0.8	0.1	**5.1**	1.1	12	54	230	<20	<50	230	0.8	0.8	2.6	4.7	15	ND	NA
BH8-2	Natural	5	<0.3	9.6	28	8	<0.05	4.4	38	NA	<0.1	3.9	1.5	**7.3**	54	18	120	**760**	83	<50	<50	1.4	N.A.	N.A.	N.A.	N.A.	ND	NA
BH8-3	Natural	<3	<0.3	3.3	19	8	<0.05	11	81	NA	<0.1	<0.8	<0.1	<0.1	0.1	0.1	0.5	<20	<20	<50	<50	0.1	N.A.	N.A.	N.A.	N.A.	ND	NA
BH9-1	Fill	6	0.4	17	20	25	<0.05	12	69	NA	<0.1	<0.8	<0.1	0.4	0.2	<0.1	0.3	<20	<20	<50	<50	0.9	<0.1	<0.1	<0.1	<0.1	ND	NA
BH9-2	Natural	<3	<0.3	11	30	12	<0.05	12	89	NA	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<20	<20	<50	<50	0.1	N.A.	N.A.	N.A.	N.A.	ND	NA
EI (27/07/2020)																												
																		F1	F2	F3	F4							
BH102_0.3-0.4	Fill	NA	NA	NA	NA	5	NA	NA	NA	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	No
BH102_1.5-1.6	Natural	NA	NA	NA	NA	11	NA	NA	NA	N.A.	N.A.	N.A.	N.A.	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
BH102_3.6-3.7	Natural	NA	NA	NA	NA	15	NA	NA	NA	N.A.	N.A.	N.A.	N.A.	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
BH103_0.3-0.4	Fill	NA	NA	NA	NA	110	NA	NA	NA	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	340	160	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**Yes**
BH104_0.2-0.3	Fill	NA	NA	NA	NA	1	NA	NA	NA	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	No
BH105_0.3-0.4	Fill	NA	NA	NA	NA	7	NA	NA	NA	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	No
BH105_1.9-2.0	Natural	NA	NA	NA	NA	16	NA	NA	NA	N.A.	N.A.	N.A.	N.A.	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
BH105_3.9-4.0	Natural	NA	NA	NA	NA	13	NA	NA	NA	N.A.	N.A.	N.A.	N.A.	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
BH106_0.4-0.5	Fill	NA	NA	NA	NA	9	NA	NA	NA	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	No
BH106_1.9-2.0	Natural	NA	NA	NA	NA	19	NA	NA	NA	N.A.	N.A.	N.A.	N.A.	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
BH106_3.9-4.0	Natural	NA	NA	NA	NA	12	NA	NA	NA	N.A.	N.A.	N.A.	N.A.	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
BH107_0.3-0.4	Fill	NA	NA	NA	NA	3	NA	NA	NA	3.1	1.3	23	1.4	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	No
BH107_1.9-2.0	Natural	NA	NA	NA	NA	12	NA	NA	NA	N.A.	N.A.	N.A.	N.A.	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
BH107_3.9-4.0	Natural	NA	NA	NA	NA	14	NA	NA	NA	N.A.	N.A.	N.A.	N.A.	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Statistical Analysis																												
Maximum concentration		17	0.4	17	41	110	0.08	23	89	3.1	1.3	23	1.5	7.3	54	18	120	760	83	340	230	2.3	0.8	2.6	4.7	15	<PQL	Yes
95% UCL		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
SILs																												
HIL B - Residential (minimal soil access)		500	150	500 Cr(VI)	30,000	1,200	120	12,000	60,000	4		400										3,000	240 [2]	NR	70 [2]	710 [2]		
HSL D - Commercial / Industrial Soil texture classification – Clay	Source depths (0 m to <1 m. BGL)												NL	3	NL	NL	NL	310	NL									
	Source depths (1 m to <2 m. BGL)												NL	6	NL	NL	NL	480	NL									
	Source depths (2m to <4 m. BGL)												NL	9	NL	NL	NL	NL	NL									
	Source depths (4 m+)												NL	20	NL	NL	NL	NL	NL									
EILs / ESLs - Urban residential and public open space [1] [2]		100		205	90	1260		35	190		33 [3]		170	50	85	70	105	180	120	300	2800							
Management Limits - Residential, parkland and public open space [1]																		800	1,000	3,500	10,000							

Notes: All results are recorded in mg/kg (unless otherwise stated)

ND 'Not detected' i.e. all concentrations of the compounds within the analyte group were found to be below the laboratory limits of detection.
NA 'Not Analysed' i.e. the sample was not analysed.
NC Not Calculated'
NL Not Limiting'
1 Majority of the fill to be found as clayey material. Therefore, fine grained soil (clay) values were applied.
2 USEPA (2009) Region 9 Screening Levels for Residential Soil as a conservative approach
F1 C6-C10 minus BTEX
F2 >C10-C16 minus Naphthalene
F3 (>C16-C34)
F4 (>C34-C40)
Highlighted indicates concentration exceeded health screening criteria
Highlighted indicates criteria exceeded

Table B-2 Summary of QA/QC Results for Soil Investigation Samples

Site: 190 Waterloo Rd Greenacre

Job No: E24847

Date	Sample Identification	Description	TRH				BTEX				
			F1	F2	F3	F4	Benzene	Toluene	Ethylbenzene	Xylene (total)	Lead
Intra-laboratory Duplicate											
22-Sep-20	BH103_0.3-0.4	Primary Soil Sample	<25	<25	340	160	<0.1	<0.1	<0.1	<0.3	110
22-Sep-20	BH100_QD1	Intra-laboratory Duplicate	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	170
RPD			*0.00*	*0.00*	129.87	*36.36*	*0.00*	*0.00*	*0.00*	*0.00*	*42.86*
Inter-laboratory Duplicate											
22-Sep-20	BH103_0.3-0.4	Primary Soil Sample	<25	<25	340	160	<0.1	<0.1	<0.1	<0.3	110
22-Sep-20	BH100_QT1	Inter-laboratory Duplicate	<25	<50	450	410	<0.2	<0.5	<1	<3	150
RPD			*0.00*	*NA*	*27.85*	87.72	*NA*	*NA*	*NA*	*NA*	*30.77*
Trip Blanks											
22-Sep-20	QTB1	Trip Blank	-	-	-	-	<0.5	<0.5	<0.5	<1.5	-
22-Sep-20	QTS1	Trip Spike	-	-	-	-	[87%]	[91%]	[93%]	[94%]	-
Rinsate Blanks											
22-Sep-20	BH100_QR1	De-ionised Water	<50	<60	<500	<500	<0.5	<0.5	<0.5	<1.5	3

52.17 Indicates values where a single result is found to be less than detection, with the duplicate sample found to be over the detection limit.

82.35 RPD exceeds 30-50% range referenced from AS4482.1 (2005)

NOTE: All soil results are reported in mg/kg . All water results are reported in µg/L.

F1 = TRH C6-C10 less the sum of BTEX

F2 = TRH >C10-C16 less naphthalene

F3 = TRH >C16-C34

F2 = TRH >C34-C40

[1] Value shown is the lowest recovery value reported for xylenes

Appendix C – Site Photographs

Photograph 1: South side of site and structures (25/01/2012).

Photograph 2: East side of site and structures (25/01/2012).

Photograph 3: Cone indicates position of BH1/MW1 on north-east corner of site (25/01/2012).

Photograph 4: East side of site, cones indicate borehole locations. Original BH2/MW2 can be seen in far south-east corner (25/01/2012).

Photograph 5: Area in vicinity of BH103 (22/9/2020).

Photograph 6: Single bowser and fill points south of structure (22/9/2020).

Photograph 7: Central site structure (22/9/2020).

Photograph 8: South-western portion of the site (22/9/2020).

Photograph 9: Central bowsers and fill points (05/02/2025).

Photograph 10: South-central bowser and fill points (05/02/2025).

Photograph 11: Position of BH3/MW3 on west side of site (05/02/2025).

Photograph 12: Position of GW1X on south side of site (05/02/2025).

Photograph 13: Central bowsers and fill points (05/02/2025)

Photograph 14: Position of GW1X (05/02/2025)

Appendix D – Borehole Logs

BOREHOLE: BH101

Project	Detailed Site Investigation		
Location	190 Waterloo Road, Greenacre NSW		
Position	Refer to Figure 2		
Job No.	E24847.E02	Contractor	Hartgeo Drilling Pty Ltd
Client	MMDA Pty Ltd	Drill Rig	Ute Mounted Drill Rig
		Inclination	-90°

Sheet	1 OF 1
Date Started	22/9/20
Date Completed	22/9/20
Logged	SL
Checked	SL

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	-	GWNE	0.0	0.10				-	CONCRETE; 100 mm thick.	-	-	CONCRETE HARDSTAND
				0.30	BH101_0.2-0.3 QA/QC PID = 1.5 ppm			-	FILL: Sandy CLAY; low plasticity, pale brown, fine grained sand, with sub-angular to angular gravels, no odour.	D	-	FILL
			0.5		BH101_0.7-0.8 ES PID = 0.7 ppm			CI-CH	Silty CLAY; medium to high plasticity, pale grey-orange, no odour.	M	-	NATURAL
			1.0	1.00					Hole Terminated at 1.00 mBGL; Target Depth Reached.			
			1.5									
			2.0									
			2.5									
			3.0									
			3.5									
			4.0									
			4.5									
			5.0									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

BOREHOLE: BH102

eiaustralia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	190 Waterloo Road, Greenacre NSW			Date Started	22/9/20
Position	Refer to Figure 2			Date Completed	22/9/20
Job No.	E24847.E02	Contractor	Hartgeo Drilling Pty Ltd	Logged	SL
Client	MMDA Pty Ltd	Drill Rig	Ute Mounted Drill Rig	Checked	SL
		Inclination	-90°		

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	-	GWNE	0.0	0.10				-	CONCRETE; 100 mm thick.	-	-	CONCRETE HARDSTAND
					BH102_0.3-0.4 ES PID = 4.6 ppm			-	FILL: Sandy CLAY; low plasticity, pale brown, fine grained sand, with sub-angular to angular gravels, no odour.	D	-	FILL
			0.5	0.60				CI-CH	Silty CLAY; medium to high plasticity, pale grey-orange, no odour.			NATURAL
					BH102_0.9-1.0 ES PID = 3.2 ppm					M	-	
			1.0									
			1.5	1.60	BH102_1.5-1.6 ES PID = 2.9 ppm			-	SHALE; dark brown, extremely weathered, no odour.			BEDROCK
			2.0									
					BH102_2.4-2.5 ES PID = 3 ppm					D	-	
			2.5	3.00					From 3.0 m, orange, no odour.			
			3.0									
			3.5		BH102_3.6-3.7 ES PID = 2.4 ppm							
			4.0	4.00					Hole Terminated at 4.00 mBGL; Target Depth Reached.			
			4.5									
			5.0									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

BOREHOLE: BH103

Project	Detailed Site Investigation		
Location	190 Waterloo Road, Greenacre NSW		
Position	Refer to Figure 2		
Job No.	E24847.E02	Contractor	Hartgeo Drilling Pty Ltd
Client	MMDA Pty Ltd	Drill Rig	Ute Mounted Drill Rig
		Inclination	-90°

Sheet	1 OF 1
Date Started	22/9/20
Date Completed	22/9/20
Logged	SL
Checked	SL

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	-	GWNE	0.0		BH103_0.3-0.4 QD1/ QT1 PID = 3.9 ppm			-	FILL: Sandy CLAY; low plasticity, pale brown, fine grained sand, with sub-angular to angular gravels, no odour.	D	-	FILL
			0.5									
				0.80				CI-CH	Silty CLAY; medium to high plasticity, pale grey-orange, no odour.	M	-	NATURAL
			1.0	*1.10*	BH103_1.0-1.1 ES PID = 2.1 ppm				Hole Terminated at 1.10 mBGL; Target Depth Reached.			
			1.5									
			2.0									
			2.5									
			3.0									
			3.5									
			4.0									
			4.5									
			5.0									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

BOREHOLE: BH104

eiaustralia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	190 Waterloo Road, Greenacre NSW			Date Started	22/9/20
Position	Refer to Figure 2			Date Completed	22/9/20
Job No.	E24847.E02	Contractor	Hartgeo Drilling Pty Ltd	Logged	SL
Client	MMDA Pty Ltd	Drill Rig	Ute Mounted Drill Rig	Checked	SL
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0.0	0.10				-	CONCRETE; 100 mm thick.	-	-	CONCRETE HARDSTAND
AD/T	-	GWNE			BH104_0.2-0.4 ES PID = 4.7 ppm			-	FILL: Sandy CLAY; low plasticity, pale brown, fine grained sand, with sub-angular to angular gravels, no odour.	D	-	FILL
			0.5	0.40				CI-CH	Silty CLAY; medium to high plasticity, pale grey-orange, no odour.			NATURAL
			1.0		BH104_0.9-1.0 ES PID = 1.8 ppm					M	-	
			1.5	1.70	BH104_1.6-1.7 ES PID = 2.6 ppm				Hole Terminated at 1.70 mBGL; Target Depth Reached.			
			2.0									
			2.5									
			3.0									
			3.5									
			4.0									
			4.5									
			5.0									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

BOREHOLE: BH105

eiaustralia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	190 Waterloo Road, Greenacre NSW			Date Started	22/9/20
Position	Refer to Figure 2			Date Completed	22/9/20
Job No.	E24847.E02	Contractor	Hartgeo Drilling Pty Ltd	Logged	SL
Client	MMDA Pty Ltd	Drill Rig	Ute Mounted Drill Rig	Checked	SL
		Inclination	-90°		

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	-	GWNE	0.0	0.10				-	CONCRETE; 100 mm thick.	-	-	CONCRETE HARDSTAND
					BH105_0.3-0.4 ES PID = 3.9 ppm			-	FILL: Sandy CLAY; low plasticity, pale brown, fine grained sand, with sub-angular to angular gravels, no odour.	D	-	FILL
			0.5	0.50				CI-CH	Silty CLAY; medium to high plasticity, pale grey-orange, no odour.			NATURAL
					BH105_0.9-1.0 ES PID = 4.2 ppm					M	-	
			1.0									
			1.5	1.50				-	SHALE; dark brown, extremely weathered, no odour.			BEDROCK
					BH105_1.9-2.0 ES PID = 5.3 ppm							
			2.0									
			2.5							D	-	
					BH105_2.9-3.0 ES PID = 2.4 ppm							
			3.0									
				3.20					From 3.2 m, orange, no odour.			
			3.5									
					BH105_3.9-4.0 ES PID = 1.8 ppm							
			4.0	4.00					Hole Terminated at 4.00 mBGL; Target Depth Reached.			
			4.5									
			5.0									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

BOREHOLE: BH106

eiaustralia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	190 Waterloo Road, Greenacre NSW			Date Started	22/9/20
Position	Refer to Figure 2			Date Completed	22/9/20
Job No.	E24847.E02	Contractor	Hartgeo Drilling Pty Ltd	Logged	SL
Client	MMDA Pty Ltd	Drill Rig	Ute Mounted Drill Rig	Checked	SL
		Inclination	-90°		

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	-	GWNE	0.0	0.10				-	CONCRETE; 100 mm thick.	-	-	CONCRETE HARDSTAND
								-	FILL: Sandy CLAY; low plasticity, pale brown, fine grained sand, with sub-angular to angular gravels, no odour.	D	-	FILL
			0.5	0.70	BH106_0.4-0.5 ES PID = 6.7 ppm			CI-CH	Silty CLAY; medium to high plasticity, pale grey-orange, no odour.			NATURAL
			1.0		BH106_0.9-1.0 ES PID = 1.9 ppm							
			1.5									
			2.0		BH106_1.9-2.0 ES PID = 3.2 ppm					M	-	
			2.5									
			3.0		BH106_2.9-3.0 ES PID = 3.5 ppm							
			3.5	3.60				-	SHALE; dark brown, extremely weathered, no odour.	D	-	BEDROCK
			4.0	4.00	BH106_3.9-4.0 ES PID = 2.9 ppm				Hole Terminated at 4.00 mBGL; Target Depth Reached.			
			4.5									
			5.0									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

BOREHOLE: BH107

eiaustralia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	190 Waterloo Road, Greenacre NSW			Date Started	22/9/20
Position	Refer to Figure 2			Date Completed	22/9/20
Job No.	E24847.E02	Contractor	Hartgeo Drilling Pty Ltd	Logged	SL
Client	MMDA Pty Ltd	Drill Rig	Ute Mounted Drill Rig	Checked	SL
		Inclination	-90°		

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0.0	0.10				-	CONCRETE; 100 mm thick.	-	-	CONCRETE HARDSTAND
								-	FILL: Sandy CLAY; low plasticity, pale brown, fine grained sand, with sub-angular to angular gravels, no odour.	D	-	FILL
AD/T	-	GWNE	0.5	0.50	BH107_0.3-0.4 ES PID = 5 ppm			CI-CH	Silty CLAY; medium to high plasticity, pale grey-orange, no odour.			NATURAL
			1.0		BH107_0.9-1.0 ES PID = 4.1 ppm							
			1.5									
			2.0		BH107_1.9-2.0 ES PID = 3.6 ppm					M	-	
			2.5									
			3.0		BH107_2.9-3.0 ES PID = 2.7 ppm							
				3.40				-	SHALE; dark brown, extremely weathered, no odour.			BEDROCK
			3.5							D	-	
				4.00	BH107_3.9-4.0 ES PID = 2.9 ppm							
			4.0						Hole Terminated at 4.00 mBGL; Target Depth Reached.			
			4.5									
			5.0									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

EXPLANATION OF NOTES, ABBREVIATIONS & TERMS USED ON BOREHOLE AND TEST PIT LOGS

DRILLING/EXCAVATION METHOD

HA	Hand Auger	**ADH**	Hollow Auger	**NQ**	Diamond Core - 47 mm
DT	Diatube Coring	**RT**	Rotary Tricone bit	**NMLC**	Diamond Core - 52 mm
NDD	Non-destructive digging	**RAB**	Rotary Air Blast	**HQ**	Diamond Core - 63 mm
AD*	Auger Drilling	**RC**	Reverse Circulation	**HMLC**	Diamond Core - 63 mm
***V**	V-Bit	**PT**	Push Tube	**EX**	Tracked Hydraulic Excavator
***T**	TC-Bit, e.g. AD/T	**WB**	Washbore	**HAND**	Excavated by Hand Methods

PENETRATION RESISTANCE

L	**Low Resistance**	Rapid penetration/ excavation possible with little effort from equipment used.
M	**Medium Resistance**	Penetration/ excavation possible at an acceptable rate with moderate effort from equipment used.
H	**High Resistance**	Penetration/ excavation is possible but at a slow rate and requires significant effort from equipment used.
R	**Refusal/Practical Refusal**	No further progress possible without risk of damage or unacceptable wear to equipment used.

These assessments are subjective and are dependent on many factors, including equipment power and weight, condition of excavation or drilling tools and experience of the operator.

WATER

Standing Water Level **Partial water loss**

Water Seepage **Complete Water Loss**

GWNO	GROUNDWATER NOT OBSERVED - Observation of groundwater, whether present or not, was not possible due to drilling water, surface seepage or cave-in of the borehole/ test pit.
GWNE	GROUNDWATER NOT ENCOUNTERED - Borehole/ test pit was dry soon after excavation. However, groundwater could be present in less permeable strata. Inflow may have been observed had the borehole/ test pit been left open for a longer period.

SAMPLING AND TESTING

SPT	Standard Penetration Test to AS1289.6.3.1-2004
4,7,11 N=18	4,7,11 = Blows per 150mm. N = Blows per 300mm penetration following a 150mm seating drive
30/80mm	Where practical refusal occurs, the blows and penetration for that interval are reported, N is not reported
RW	Penetration occurred under the rod weight only, N<1
HW	Penetration occurred under the hammer and rod weight only, N<1
HB	Hammer double bouncing on anvil, N is not reported
Sampling	
DS	Disturbed Sample
ES	Sample for environmental testing
BDS	Bulk disturbed Sample
GS	Gas Sample
WS	Water Sample
U50	Thin walled tube sample - number indicates nominal sample diameter in millimetres
Testing	
FP	Field Permeability test over section noted
FVS	Field Vane Shear test expressed as uncorrected shear strength (sv= peak value, sr= residual value)
PID	Photoionisation Detector reading in ppm
PM	Pressuremeter test over section noted
PP	Pocket Penetrometer test expressed as instrument reading in kPa
WPT	Water Pressure tests
DCP	Dynamic Cone Penetrometer test
CPT	Static Cone Penetration test
CPTu	Static Cone Penetration test with pore pressure (u) measurement

GEOLOGICAL BOUNDARIES

———— = Observed Boundary (position known)

– – – – – – – – – – = Observed Boundary (position approximate)

– –?– –?– –?– – = Boundary (interpreted or inferred)

ROCK CORE RECOVERY

TCR=Total Core Recovery (%)

$$= \frac{Length\ of\ core\ recovered}{Length\ of\ core\ run} \times 100$$

RQD = Rock Quality Designation (%)

$$= \frac{\sum Axial\ lengths\ of\ core > 100mm}{Length\ of\ core\ run} \times 100$$

METHOD OF SOIL DESCRIPTION USED ON BOREHOLE AND TEST PIT LOGS

	FILL		ORGANIC SOILS (OL, OH or Pt)		CLAY (CL, CI or CH)
	COUBLES or BOULDERS		SILT (ML or MH)		SAND (SP or SW)
	GRAVEL (GP or GW)	Combinations of these basic symbols may be used to indicate mixed materials such as sandy clay			

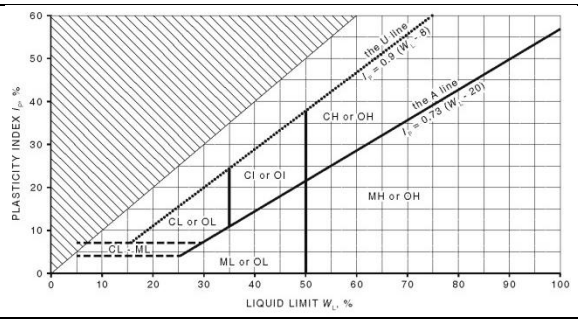
CLASSIFICATION AND INFERRED STRATIGRAPHY

Soil is broadly classified and described in Borehole and Test Pit Logs using the preferred method given in AS 1726:2017, Section 6.1 – Soil description and classification.

PARTICLE SIZE CHARACTERISTICS

Fraction	Components	Sub Division	Size mm
Oversize	BOULDERS		>200
	COBBLES		63 to 200
Coarse grained soil	GRAVEL	Coarse	19 to 63
		Medium	6.7 to 19
		Fine	2.36 to 6.7
	SAND	Coarse	0.6 to 2.36
		Medium	0.21 to 0.6
		Fine	0.075 to 0.21
Fine grained soil	SILT		0.002 to 0.075
	CLAY		<0.002

PLASTICITY PROPERTIES



GROUP SYMBOLS

Major Divisions		Symbol	Description
COARSE GRAINED SOILS More than 65% of soil excluding oversize fraction is greater than 0.075mm	GRAVEL More than 50% of coarse fraction is >2.36mm	GW	Well graded gravel and gravel-sand mixtures, little or no fines, no dry strength.
		GP	Poorly graded gravel and gravel-sand mixtures, little or no fines, no dry strength.
		GM	Silty gravel, gravel-sand-silt mixtures, zero to medium dry strength.
		GC	Clayey gravel, gravel-sand-clay mixtures, medium to high dry strength.
	SAND More than 50% of coarse fraction is <2.36 mm	SW	Well graded sand and gravelly sand, little or no fines, no dry strength.
		SP	Poorly graded sand and gravelly sand, little or no fines, no dry strength.
		SM	Silty sand, sand-silt mixtures, zero to medium dry strength.
		SC	Clayey sand, sandy-clay mixtures, medium to high dry strength.
FINE GRAINED SOILS More than 35% of soil excluding oversized fraction is less than 0.075mm	Liquid Limit less < 50%	ML	Inorganic silts of low plasticity, very fine sands, rock flour, silty or clayey fine sands, zero to medium dry strength.
		CL, CI	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, medium to high dry strength.
		OL	Organic silts and organic silty clays of low plasticity, low to medium dry strength.
	Liquid Limit > than 50%	MH	Inorganic silts of high plasticity, high to very high dry strength.
		CH	Inorganic clays of high plasticity, high to very high dry strength.
		OH	Organic clays of medium to high plasticity, medium to high dry strength.
Highly Organic soil		PT	Peat muck and other highly organic soils.

MOISTURE CONDITION

Symbol	Term	Description
D	Dry	Non- cohesive and free-running.
M	Moist	Soils feel cool, darkened in colour. Soil tends to stick together.
W	Wet	Soils feel cool, darkened in colour. Soil tends to stick together, free water forms when handling.

Moisture content of cohesive soils shall be described in relation to plastic limit (PL) or liquid limit (LL) for soils with higher moisture content as follows: Moist, dry of plastic limit (w < PL); Moist, near plastic limit (w ≈ PL); Moist, wet of plastic limit (w < PL); Wet, near liquid limit (w ≈ LL), Wet, wet of liquid limit (w > LL),

CONSISTENCY

Symbol	Term	Undrained Shear Strength (kPa)	SPT "N" #
VS	Very Soft	≤ 12	≤ 2
S	Soft	>12 to ≤ 25	>2 to ≤ 4
F	Firm	>25 to ≤ 50	>4 to 8
St	Stiff	>50 to ≤ 100	>8 to 15
VSt	Very Stiff	>100 to ≤ 200	>15 to 30
H	Hard	>200	>30
Fr	Friable	-	

DENSITY

Symbol	Term	Density Index %	SPT "N" #
VL	Very Loose	≤ 15	0 to 4
L	Loose	>15 to ≤ 35	4 to 10
MD	Medium Dense	>35 to ≤ 65	10 to 30
D	Dense	>65 to ≤ 85	30 to 50
VD	Very Dense	>85	Above 50

In the absence of test results, consistency and density may be assessed from correlations with the observed behaviour of the material. # SPT correlations are not stated in AS1726:2017, and may be subject to corrections for overburden pressure, moisture content of the soil, and equipment type.

MINOR COMPONENTS

Term	Assessment Guide	Proportion by Mass
Add 'Trace'	Presence just detectable by feel or eye but soil properties little or no different to general properties of primary component	Coarse grained soils: ≤ 5% Fine grained soil: ≤ 15%
Add 'With'	Presence easily detectable by feel or eye but soil properties little or no different to general properties of primary component	Coarse grained soils: 5 - 12% Fine grained soil: 15 - 30%
Prefix soil name	Presence easily detectable by feel or eye in conjunction with the general properties of primary component	Coarse grained soils: >12% Fine grained soil: >30%

TERMS FOR ROCK MATERIAL STRENGTH AND WEATHERING

CLASSIFICATION AND INFERRED STRATIGRAPHY

Rock is broadly classified and described in Borehole and Test Pit Logs using the preferred method given in AS1726 – 2017, Section 6.2 – Rock identification, description and classification.

ROCK MATERIAL STRENGTH CLASSIFICATION

Symbol	Term	Point Load Index, $Is_{(50)}$ (MPa) #	Field Guide
VL	Very Low	0.03 to 0.1	Material crumbles under firm blows with sharp end of pick; can be peeled with knife; too hard to cut a triaxial sample by hand. Pieces up to 30 mm can be broken by finger pressure.
L	Low	0.1 to 0.3	Easily scored with a knife; indentations 1 mm to 3 mm show in the specimen with firm blows of pick point; has dull sound under hammer. A piece of core 150 mm long by 50 mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
M	Medium	0.3 to 1	Readily scored with a knife; a piece of core 150 mm long by 50 mm diameter can be broken by hand with difficulty.
H	High	1 to 3	A piece of core 150 mm long by 50 mm diameter cannot be broken by hand but can be broken with pick with a single firm blow; rock rings under hammer.
VH	Very High	3 to 10	Hand specimen breaks with pick after more than one blow; rock rings under hammer.
EH	Extremely High	>10	Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.

 # Rock Strength Test Results

▼ Point Load Strength Index, $Is_{(50)}$, Axial test (MPa)

● Point Load Strength Index, $Is_{(50)}$, Diametral test (MPa)

Relationship between rock strength test result ($Is_{(50)}$) and unconfined compressive strength (UCS) will vary with rock type and strength, and should be determined on a site-specific basis. However UCS is typically 20 x $Is_{(50)}$.

ROCK MATERIAL WEATHERING CLASSIFICATION

Symbol		Term	Field Guide
RS		Residual Soil	Soil developed on extremely weathered rock; the mass structure and substance fabric are no longer evident; there is a large change in volume but the soil has not been significantly transported.
XW		Extremely Weathered	Rock is weathered to such an extent that it has soil properties - i.e. it either disintegrates or can be remoulded, in water.
DW	HW	Distinctly Weathered	Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores. In some environments it is convenient to subdivide into Highly Weathered and Moderately Weathered, with the degree of alteration typically less for MW.
	MW		
SW		Slightly Weathered	Rock slightly discoloured but shows little or no change of strength relative to fresh rock.
FR		Fresh	Rock shows no sign of decomposition or staining.

ABBREVIATIONS AND DESCRIPTIONS FOR ROCK MATERIAL AND DEFECTS

CLASSIFICATION AND INFERRED STRATIGRAPHY
Rock is broadly classified and described in Borehole and Test Pit Logs using the preferred method given in AS1726 – 2017, Section 6.2 – Rock identification, description and classification.

DETAILED ROCK DEFECT SPACING

Defect Spacing

Spacing/width (mm)	Descriptor	Symbol
<20	Extremely Close	EC
20-60	Very Close	VC
60-200	Close	C
200-600	Medium	M
600-2000	Wide	W
2000-6000	Very Wide	VW

Bedding Thickness (Stratification)

Term	Spacing (mm)
Thinly laminated	<6
Laminated	6 – 20
Very thinly bedded	20 – 60
Thinly bedded	60 – 200
Medium bedded	200 – 600
Thickly bedded	600 – 2,000
Very thickly bedded	> 2,000

ABBREVIATIONS AND DESCRIPTIONS FOR DEFECT TYPES

Defect Type	Abbr.	Description
Joint	JT	Surface of a fracture or parting, formed without displacement, across which the rock has little or no tensile strength. May be closed or filled by air, water or soil or rock substance, which acts as cement.
Bedding Parting	BP	Surface of fracture or parting, across which the rock has little or no tensile strength, parallel or sub-parallel to layering/ bedding. Bedding refers to the layering or stratification of a rock, indicating orientation during deposition, resulting in planar anisotropy in the rock material.
Contact	CO	The surface between two types or ages of rock.
Sheared Surface	SSU	A near planar, curved or undulating surface which is usually smooth, polished or slickensided.
Sheared Seam/ Zone (Fault)	SS/SZ	Seam or zone with roughly parallel almost planar boundaries of rock substance cut by closely spaced (often <50 mm) parallel and usually smooth or slickensided joints or cleavage planes.
Crushed Seam/ Zone (Fault)	CS/CZ	Seam or zone composed of disoriented usually angular fragments of the host rock substance, with roughly parallel near-planar boundaries. The brecciated fragments may be of clay, silt, sand or gravel sizes or mixtures of these.
Extremely Weathered Seam/ Zone	XWS/XWZ	Seam of soil substance, often with gradational boundaries, formed by weathering of the rock material in places.
Infilled Seam	IS	Seam of soil substance, usually clay or clayey, with very distinct roughly parallel boundaries, formed by soil migrating into joint or open cavity.
Vein	VN	Distinct sheet-like body of minerals crystallised within rock through typically open-space filling or crack-seal growth.

NOTE: Defects size of <100mm SS, CS and XWS. Defects size of >100mm SZ, CZ and XWZ.

ABBREVIATIONS AND DESCRIPTIONS FOR DEFECT SHAPE AND ROUGHNESS

Shape	Abbr.	Description	Roughness	Abbr.	Description
Planar	PR	Consistent orientation	Polished	POL	Shiny smooth surface
Curved	CU	Gradual change in orientation	Slickensided	SL	Grooved or striated surface, usually polished
Undulating	UN	Wavy surface	Smooth	SM	Smooth to touch. Few or no surface irregularities
Stepped	ST	One or more well defined steps	Rough	RO	Many small surface irregularities (amplitude generally <1mm). Feels like fine to coarse sandpaper
Irregular	IR	Many sharp changes in orientation	Very Rough	VR	Many large surface irregularities, amplitude generally >1mm. Feels like very coarse sandpaper

Orientation: **Vertical Boreholes –** The dip (inclination from horizontal) of the defect.
Inclined Boreholes – The inclination is measured as the acute angle to the core axis.

ABBREVIATIONS AND DESCRIPTIONS FOR DEFECT COATING

Coating	Abbr.	Description
Clean	CN	No visible coating or infilling
Stain	SN	No visible coating but surfaces are discoloured by staining, often limonite (orange-brown)
Veneer	VNR	A visible coating of soil or mineral substance, usually too thin to measure (< 1 mm); may be patchy

DEFECT APERTURE

Aperture	Abbr.	Description
Closed	CL	Closed.
Open	OP	Without any infill material.
Infilled	-	Soil or rock i.e. clay, silt, talc, pyrite, quartz, etc.

Appendix E – Calibration Form and Field Data Sheets

EI Australia
Suite 6.01, 55 Miller Street
PYRMONT, NSW, 2009

ABN 33 102 449 507
E service@eiaustralia.com.au
W www.eiaustralia.com.au
T 02 9516 0722

CALIBRATION CERTIFICATE FOR PHOTO IONISATION DETECTOR

Instrument: Mini RAE 3000

Serial Number: 592-906667 - EI **PID02** ☐ **OR** 592-901345 - EI **PID03** ☑

Instrument Conditions: good

Calibration gas species: Isobutylene.

Calibration gas concentration: 100 ppm

Gas bottle number: 1074822/102

This PID has been calibrated to Isobutylene gas with the span concentration displayed as 101 ppm at 100 ppm span setting (allowable range +/-10ppm from span setting).

The PID is initially zero calibrated in fresh air.

Remaining gas in bottle: 750 psi (if reading is <250 psi, notify Equipment Manager to arrange new gas bottle order)

The above detector was calibrated in accordance with manufacturer's specifications.

Signed: [signature]

Date: 22-5-20

Time: 8am

EI Australia
Suite 6.01, 55 Miller Street
PYRMONT, NSW, 2009

ABN 33 102 449 507
E service@eiaustralia.com.au
W www.eiaustralia.com.au
T 02 9516 0722

CALIBRATION CERTIFICATE
FOR PHOTO IONISATION DETECTOR

Instrument: Mini RAE 3000

Serial Number: 592-906667 - EI PID02 ☑ OR 592-901345 - EI PID03 ☐ OR _____ EI PID___ ☐

Instrument Conditions: Fine.

Calibration gas species: Isobutylene.

Calibration gas concentration: __100_____ppm

Gas bottle number: _____ _____

This PID has been calibrated to Isobutylene gas with the span concentration displayed as

___ppm at __ppm span setting (allowable range +/-10ppm from span setting).

The PID is initially zero calibrated in fresh air.

Remaining gas in bottle: ____psi (if reading is <250 psi, notify Equipment Manager to arrange new gas bottle order)

The above detector was calibrated in accordance with manufacturer's specifications.

Signed: _____

Date: 5/2/25

Time: 9:15 AM

Bump Test passed.

WATER SAMPLING FIELD SHEET

eiaustralia

Site Address: 190 Waterloo Road, Greenacre NSW	Job Number: E24847
Client: Ghazi Al Ali Architect	Date: 05/02/2025
Field Staff: CT/LJ	Sampling Location ID :
Well Location: BH3/MW3	Round No:

MEDIUM ☑Groundwater ☐Surface Water ☐Stormwater ☐Other:

SAMPLING POINT INFO

Well Installation Date:	Stick up / down (m): (+ above ground - below ground)
Initial Well Depth (mBTOC):	Screen Interval (mBTOC):
Previous Sampling Date:	Previous SWL (mBTOC):

PID READINGS

PID Headspace (ppm): 0.7	PID Background (ppm): 0
PID Breathing Space (ppm): 0.1	

PRE PURGE

Total Well Depth (mBTOC): 5	Well Head Condition:
SWL (mBTOC): 4.11	Water Column (m):

PHASE SEPARATED HYDROCARBONS (PSH)

Depth to PSH (mBTOC):	PSH Visually Confirmed (Bailer):
PSH Thickness (mm):	

Field Filtered

Yes (0.45 µm) ☐	No ☐ (Request lab 0.45 µm filter the sample)

PURGE AND SAMPLE

Sampling Method ☐Bladder ☐Peristaltic ☐Submersible ☐Other:

Depth of Pump Inlet (mBTOC):	Fill Timer:
Pump Pressure Regulator (psi):	Discharge Timer:
Weather Conditions:	Cycle:
Pump on time:	Pump off time:

WATER QUALITY PARAMETERS

Probe Make and Model:	Bump Test Date and Time:

Time	Volume (L)	SWL (mbtoc)	Temp (°C)	EC (µS/cm)	Redox (mV)	DO (mg/L)	pH (units)	Comments (colour, turbidity, odour, sheen etc.)
Stabilisation range: 3 consecutive readings			**±0.2°C**	**±3%**	**±20mV**	**±10%**	**±0.2**	

OTHER COMMENTS/OBSERVATIONS:

SIGNATURE:

WATER SAMPLING FIELD SHEET

eiaustralia

Site Address: 190 Waterloo Road, Greenacre NSW	Job Number: E24847
Client: Ghazi Al Ali Architect	Date: 05/02/2025
Field Staff: CT/LJ	Sampling Location ID
Well Location: BH1 / MW1	Round No:

MEDIUM ☑Groundwater ☐Surface Water ☐Stormwater ☐Other:

SAMPLING POINT INFO

Well Installation Date:	Stick up / down (m): (+ above ground - below ground)
Initial Well Depth (mBTOC):	Screen Interval (mBTOC):
Previous Sampling Date:	Previous SWL (mBTOC):

PID READINGS

PID Headspace (ppm): 0	PID Background (ppm): 0
PID Breathing Space (ppm): 0	

PRE PURGE

Total Well Depth (mBTOC): 5	Well Head Condition: Fine
SWL (mBTOC): 3.75	Water Column (m):

PHASE SEPARATED HYDROCARBONS (PSH)

Depth to PSH (mBTOC):	PSH Visually Confirmed (Bailer):
PSH Thickness (mm):	

Field Filtered

Yes (0.45 µm) ☐	No ☐ (Request lab 0.45 µm filter the sample)

PURGE AND SAMPLE

Sampling Method ☐Bladder ☐Peristaltic ☐Submersible ☐Other:

Depth of Pump Inlet (mBTOC):	Fill Timer:
Pump Pressure Regulator (psi):	Discharge Timer:
Weather Conditions:	Cycle:
Pump on time:	Pump off time:

WATER QUALITY PARAMETERS

Probe Make and Model:	Bump Test Date and Time:

Time	Volume (L)	SWL (mbtoc)	Temp (°C)	EC (µS/cm)	Redox (mV)	DO (mg/L)	pH (units)	Comments (colour, turbidity, odour, sheen etc.)
Stabilisation range: 3 consecutive readings			**±0.2°C**	**±3%**	**±20mV**	**±10%**	**±0.2**	

OTHER COMMENTS/OBSERVATIONS:

SIGNATURE:

WATER SAMPLING FIELD SHEET

eiaustralia

Site Address: 190 Waterloo Road, Greenacre NSW	Job Number: E24847
Client: Ghazi Al Ali Architect	Date: 05/02/2025
Field Staff: CT/LJ	Sampling Location ID
Well Location: BH2/MW2	Round No:

MEDIUM ☑Groundwater ☐Surface Water ☐Stormwater ☐Other:

SAMPLING POINT INFO

Well Installation Date:	Stick up / down (m): (+ above ground - below ground)
Initial Well Depth (mBTOC):	Screen Interval (mBTOC):
Previous Sampling Date:	Previous SWL (mBTOC):

PID READINGS

PID Headspace (ppm): 0	PID Background (ppm): 0
PID Breathing Space (ppm): 0	

PRE PURGE

Total Well Depth (mBTOC): 5.2	Well Head Condition: Fine.
SWL (mBTOC): 4.2	Water Column (m): 1

PHASE SEPARATED HYDROCARBONS (PSH)

Depth to PSH (mBTOC):	PSH Visually Confirmed (Bailer):
PSH Thickness (mm):	

Field Filtered

Yes (0.45 µm) ☐ No ☐ (Request lab 0.45 µm filter the sample)

PURGE AND SAMPLE

Sampling Method ☐Bladder ☐Peristaltic ☐Submersible ☐Other:

Depth of Pump Inlet (mBTOC):	Fill Timer:
Pump Pressure Regulator (psi):	Discharge Timer:
Weather Conditions:	Cycle:
Pump on time:	Pump off time:

WATER QUALITY PARAMETERS

Probe Make and Model:	Bump Test Date and Time:

Time	Volume (L)	SWL (mbtoc)	Temp (°C)	EC (µS/cm)	Redox (mV)	DO (mg/L)	pH (units)	Comments (colour, turbidity, odour, sheen etc.)
Stabilisation range: 3 consecutive readings			**±0.2°C**	**±3%**	**±20mV**	**±10%**	**±0.2**	

OTHER COMMENTS/OBSERVATIONS:

SIGNATURE:

Appendix F – Chain of Custody and Sample Receipt Documentation

Sheet 1 of 1

Site: 190 Waterloo Rd, Carlingford

Project No: E24847.E02

Laboratory: **Envirolab Services**
12 Ashley Street,
CHATSWOOD NSW 2067
P: 02 9910 6200

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: WATER	SOIL	OTHERS (i.e. Fibro, Paint, etc.)	Analysis: HM[A] /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM[A] /TRH/BTEX/PAHs	TRH/BTEX / LEAD	BTEX	VOCs	Asbestos	Asbestos Quantification	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Dewatering Suite	sPOCAS	PFAS	HOLD			TCLP HM[B] / PAH
BH102_QT1	1	J	22/9	PM		X				X												
QT1	2	J	↓	↓		↓														X		

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

Job No: 25 1928

Date Received: 23/09/2025

Time Received: 16:35

Received By: RL

Temp: ~~Cool/Ambient~~

Cooling: Ice/Icepack

Security: Intact/~~Broken~~/None

Comments

HM[A]
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Zinc

HM[B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

Dewatering Suite
pH & EC
TDS / Turbidity NTU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTEX
PAH
Total Phenol

LABORATORY TURNAROUND

- [x] Standard
- [ ] 24 Hours
- [ ] 48 Hours
- [ ] 72 Hours
- [ ] Other_____

Container Type:
J= solvent washed, acid rinsed,Teflon sealed, glass jar
S= solvent washed, acid rinsed glass bottle
P= natural HDPE plastic bottle
VC= glass vial, Teflon Septum
ZLB = Zip-Lock Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Report with EI Waste Classification Table ☐

Sampler's Name (EI):	Received by (Envirolab) Syd
Print: SL	Print: R Uhareen
Signature:	Signature:
Date: 23/9/20	Date: 23/09/2020. 16:35

Sampler's Comments:
Please CC Emmanuel

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

eiaustralia
Contamination | Remediation | Geotechnical
Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

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

SAMPLE RECEIPT ADVICE

Client Details

Client	EI Australia
Attention	Emmanuel Woelders

Sample Login Details

Your reference	E24847. E02
Envirolab Reference	251928
Date Sample Received	23/09/2020
Date Instructions Received	23/09/2020
Date Results Expected to be Reported	30/09/2020

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	2 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	13.7
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

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

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	Acid Extractable metalsin soil	On Hold
BH100_QT1	✓	✓	✓	
QT1				✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

Sheet 1 of 3

Site: 190 Waterloo Rd, Carlingford

Project No: E24847 E02

Laboratory: SGS Australia
Unit 16, 33 Maddox Street,
ALEXANDRIA NSW 2015
P: 02 8594 0400 F: 02 8594 0499

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: WATER	SOIL	OTHERS (i.e. Fibro, Paint, etc.)	Analysis: HM A /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos / LEAD	PAH/TRH/BTEX [redacted] / LEAD	TRH/BTEX / LEAD	BTEX	VOCs	Asbestos	Asbestos Quantification	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Dewatering Suite	sPOCAS	PFAS	HOLD			TCLP HM B / PAH
BH101_0.2-0.3		J, 2GB	22/9	PM		X														X			
0.7-0.8																				X			
BH102_0.3-0.4	1								X				X										
0.9-1.0																							
1.5-1.6	2									X													
2.4-2.5																							
3.6-3.7	3									X													
BH103_0.3-0.4	4								X				X										
1.0-1.1																							
BH104_0.2-0.3	5								X				X										
0.9-1.0																							
1.6-1.7																							

SGS EHS Sydney COC
SE211528

Comments

HM A
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Zinc

HM B
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

Dewatering Suite
pH & EC
TDS / Turbidity NTU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTEX
PAH
Total Phenol

LABORATORY TURNAROUND
- [x] Standard
- [ ] 24 Hours
- [ ] 48 Hours
- [ ] 72 Hours
- [ ] Other_____

Container Type:
J= solvent washed, acid rinsed,Teflon sealed, glass jar
S= solvent washed, acid rinsed glass bottle
P= natural HDPE plastic bottle
VC= glass vial, Teflon Septum
ZLB = Zip-Lock Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Report with EI Waste Classification Table ☐

Sampler's Name (EI):	Received by (SGS):
Print: SL	Print: Suba
Signature:	Signature:
Date: 23-9-20	Date: 23/09/20 @3.10

Sampler's Comments:
Please CC Emmanuel

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

eiaustralia
Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

Sheet 2 of 3

Site: 190 Waterloo Rd, Carlingford

Project No: E2484.E02

Laboratory: SGS Australia
Unit 16, 33 Maddox Street,
ALEXANDRIA NSW 2015
P: 02 8594 0400 F: 02 8594 0499

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: WATER	SOIL	OTHERS (i.e. Fibro, Paint, etc.)	HM [A] /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM [A] /TRH/BTEX/PAHs	TRH/BTEX / LEAD PAH	BTEX TRH/LEAD	VOCs	Asbestos	Asbestos Quantification	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Dewatering Suite	sPOCAS	PFAS				TCLP HM [B] / PAH
BH05_0.3-0.4	6	J.2LB	22/9	PM		X				X			X										
0.9-1.0																							
1.9-2.0	7										X												
2.9-3.0																							
3.9-4.0	8										X												
BH06_0.4-0.5	9									X			X										
0.9-1.0																							
1.9-2.0	10										X												
2.9-3.0																							
3.9-4.0	11										X												
BH07_0.3-0.4	12									X			X										
0.9-1.0																							

Comments

HM [A]
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Zinc

HM [B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

Dewatering Suite
pH & EC
TDS / Turbidity NTU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTEX
PAH
Total Phenol

LABORATORY TURNAROUND

- [x] Standard
- [ ] 24 Hours
- [ ] 48 Hours
- [ ] 72 Hours
- [ ] Other_____

Container Type:
J= solvent washed, acid rinsed,Teflon sealed, glass jar
S= solvent washed, acid rinsed glass bottle
P= natural HDPE plastic bottle
VC= glass vial, Teflon Septum
ZLB = Zip-Lock Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Report with EI Waste Classification Table ☐

Sampler's Name (EI):	Received by (SGS):
Print: SL	Print: Suba
Signature:	Signature:
Date: 23-9-20	Date: 23/09/20 @ 3:10

Sampler's Comments:
see 1 Page

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

eiaustralia
Contamination | Remediation | Geotechnics
Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

Sheet 3 of 3

Site: 190 Waterloo Rd, Carlingford

Project No: E24847.E02

Laboratory: SGS Australia
Unit 16, 33 Maddox Street,
ALEXANDRIA NSW 2015
P: 02 8594 0400 F: 02 8594 0499

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: WATER	SOIL	OTHERS (i.e. Fibro, Paint, etc.)	Analysis: HM[A] /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM[A] /TRH/BTEX/PAHs	~~HM~~/TRH/BTEX/LEAD	BTEX	VOCs	Asbestos	Asbestos Quantification	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Dewatering Suite	sPOCAS	PFAS	HOLD			TCLP HM[B] / PAH
BH107_1.9-2.0	13	S, ZLB	22/9	PM		X				X													
2.9-3.0		↓				↓																	
3.9-4.0	14	↓				↓				X													
BH100_QD1	15	J								X													
BH100_QR1	16	SP, VC			X					X													
BH100_QRB1		↓	↓	↓	X																		
QTS1	17	VC	Lab Prepared			X					X												
QTB1	18	VC				X					X												
QD1		J	22/9	PM		X														X			

Comments

HM[A]
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Zinc

HM[B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

Dewatering Suite
pH & EC
TDS / Turbidity NTU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTEX
PAH
Total Phenol

LABORATORY TURNAROUND

- [X] Standard
- [ ] 24 Hours
- [ ] 48 Hours
- [ ] 72 Hours
- [ ] Other_____

Container Type:
J= solvent washed, acid rinsed,Teflon sealed, glass jar
S= solvent washed, acid rinsed glass bottle
P= natural HDPE plastic bottle
VC= glass vial, Teflon Septum
ZLB = Zip-Lock Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Report with EI Waste Classification Table ☐

Sampler's Name (EI):	Received by (SGS):
Print: SL	Print: Suba
Signature:	Signature:
Date: 23-9-20	Date: 23/09/20 @3:10

Sampler's Comments:

ee 1 Page

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

eiaustralia
Contamination | Remediation | Geotechnical
Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

Sheet 1 of 3

Site: 190 Waterloo Rd, Greenacre

Project No: E26847 E02

Laboratory: SGS Australia
Unit 16, 33 Maddox Street,
ALEXANDRIA NSW 2015
P: 02 8594 0400 F: 02 8594 0499

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: WATER	SOIL	OTHERS (i.e. Fibro, Paint, etc.)	HM[A] /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	/TRH/BTEX/PAH/LEAD	/TRH/BTEX/LEAD	BTEX	VOCs	Asbestos	Asbestos Quantification	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Dewatering Suite	sPOCAS	PFAS	HOLD			TCLP HM[B] / PAH
BH101_0.2-0.3		J, 2G	22/9	PM		X														X			
0.7-0.8																				X			
BH102_0.3-0.4	1								X				X										
0.9-1.0																							
1.5-1.6	2									X													
2.4-2.5																							
3.6-3.7	3									X													
BH103_0.3-0.4	4								X				X										
1.0-1.1																							
BH104_0.2-0.3	5								X				X										
0.9-1.0																							
1.6-1.7																							

SGS EHS Sydney COC
SE211528

Comments

HM[A]
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Zinc

HM[B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

Dewatering Suite
pH & EC
TDS / Turbidity NTU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTEX
PAH
Total Phenol

LABORATORY TURNAROUND
- [x] Standard
- [ ] 24 Hours
- [ ] 48 Hours
- [ ] 72 Hours
- [ ] Other_____

Container Type:
J= solvent washed, acid rinsed, Teflon sealed, glass jar
S= solvent washed, acid rinsed glass bottle
P= natural HDPE plastic bottle
VC= glass vial, Teflon Septum
ZLB = Zip-Lock Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Report with EI Waste Classification Table ☐

Sampler's Name (EI):	Received by (SGS):
Print: SL	Print: Suba
Signature:	Signature:
Date: 23-9-20	Date: 23/09/20 @ 3.10

Sampler's Comments: Please CC Emmanuel

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

eiaustralia
Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

Sheet 2 of 3

Site: 190 Waterloo Rd, Greenacre

Project No: TE4847.E02

Laboratory: SGS Australia
Unit 16, 33 Maddox Street,
ALEXANDRIA NSW 2015
P: 02 8594 0400 F: 02 8594 0499

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: WATER	SOIL	OTHERS (i.e. Fibro, Paint, etc.)	HM [A] /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM [A] /TRH/BTEX/PAHs	TRH/BTEX / LEAD	BTEX/TRH/LEAD	VOCs	Asbestos	Asbestos Quantification	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Dewatering Suite	sPOCAS	PFAS				TCLP HM [B] / PAH
BH05_0.3-0.4	6	J, ZLB	22/9	PM		X				X			X										
0.9-1.0																		•					
1.9-2.0	7										X												
2.9-3.0																		•					
3.9-4.0	8										X												
BH06_0.4-0.5	9									X			X										
0.9-1.0																		•					
1.9-2.0	10										X												
2.9-3.0																		•					
3.9-4.0	11										X												
BH07_0.3-0.4	12									X			X										
0.9-1.0																		•					

Comments

HM [A]
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Zinc

HM [B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

Dewatering Suite
pH & EC
TDS / Turbidity NTU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTEX
PAH
Total Phenol

LABORATORY TURNAROUND

- [x] Standard
- [ ] 24 Hours
- [ ] 48 Hours
- [ ] 72 Hours
- [ ] Other_____

Container Type:
J= solvent washed, acid rinsed,Teflon sealed, glass jar
S= solvent washed, acid rinsed glass bottle
P= natural HDPE plastic bottle
VC= glass vial, Teflon Septum
ZLB = Zip-Lock Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Report with EI Waste Classification Table ☐

Sampler's Name (EI):	Received by (SGS):
Print: SL	Print: Suba
Signature:	Signature:
Date: 23-9-20	Date: 23/09/20 @ 3:10

Sampler's Comments:
see 1 Page

eiaustralia
Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

COC March 2018 FORM v.4 - SGS

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

Sheet 2 of 3

Site: 190 Waterloo Rd, Greenacre

Project No: E24847 EoT

Laboratory: SGS Australia
Unit 16, 33 Maddox Street,
ALEXANDRIA NSW 2015
P: 02 8594 0400 F: 02 8594 0499

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: WATER	SOIL	OTHERS (i.e. Fibro, Paint, etc.)	HM Δ /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM Δ /TRH/BTEX/PAHs	~~TRH~~/BTEX/LEAD	BTEX	VOCs	Asbestos	Asbestos Quantification	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Dewatering Suite	sPOCAS	PFAS	HOLD			TCLP HM ☒ / PAH
BH107_1.9-2.0	13	S, ZLB	22/9	PM		X				X													
2.9-3.0		↓				↓																	
3.9-4.0	14	↓								X													
BH100_QD1	15	J								X													
BH100_QR1	16	S, P, VL			X					X													
BH100_QRB1		↓	↓	↓	X																		
QTS1	17	VC	Lab Prepared			X					X												
QTB1	18	VC				X					X												
QD1		J	22/9	PM		X														X			

Container Type:
J= solvent washed, acid rinsed,Teflon sealed, glass jar
S= solvent washed, acid rinsed glass bottle
P= natural HDPE plastic bottle
VC= glass vial, Teflon Septum
ZLB = Zip-Lock Bag

Comments

HM Δ
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Zinc

HM ☒
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

Dewatering Suite
pH & EC
TDS / Turbidity NTU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTEX
PAH
Total Phenol

LABORATORY TURNAROUND
☒ Standard
☐ 24 Hours
☐ 48 Hours
☐ 72 Hours
☐ Other_____

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Report with EI Waste Classification Table ☐

Sampler's Name (EI):	Received by (SGS):
Print: SL	Print: Suba
Signature:	Signature:
Date: 23-9-20	Date: 23/09/20 @ 3:10

Sampler's Comments:
see 1 Page

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

eiaustralia
Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

SAMPLE RECEIPT ADVICE

SE211528

CLIENT DETAILS

Contact	Emmanuel Woelders
Client	EI AUSTRALIA
Address	SUITE 6.01 55 MILLER STREET PYRMONT NSW 2009
Telephone	61 2 95160722
Facsimile	(Not specified)
Email	emmanuel.woelders@eiaustralia.com.au
Project	**E24847.E02 190 Waterloo Rd Greenacre**
Order Number	**E24847.E02**
Samples	18

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Wed 23/9/2020
Report Due	Wed 30/9/2020
SGS Reference	**SE211528**

SUBMISSION DETAILS

This is to confirm that 18 samples were received on Wednesday 23/9/2020. Results are expected to be ready by COB Wednesday 30/9/2020. Please quote SGS reference SE211528 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	17 Soil, 1 Water
Date documentation received	23/9/2020	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	7.2°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

Unless otherwise instructed, water and bulk samples will be held for one month from date of report, and soil samples will be held for two months.

COMMENTS

14 soil and 1 water samples have been placed on hold as no tests have been assigned for them by the client. These samples will not be processed.

SAMPLE RECEIPT ADVICE

SE211528

CLIENT DETAILS

Client EI AUSTRALIA

Project E24847.E02 190 Waterloo Rd Greenacre

SUMMARY OF ANALYSIS

No.	Sample ID	Moisture Content	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	Total Recoverable Elements in Soil/Waste	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
001	BH102_0.3-0.4	1	26	1	10	11	7
002	BH102_1.5-1.6	1	-	1	10	11	7
003	BH102_3.6-3.7	1	-	1	10	11	7
004	BH103_0.3-0.4	1	26	1	10	11	7
005	BH104_0.2-0.3	1	26	1	10	11	7
006	BH105_0.3-0.4	1	26	1	10	11	7
007	BH105_1.9-2.0	1	-	1	10	11	7
008	BH105_3.9-4.0	1	-	1	10	11	7
009	BH106_0.4-0.5	1	26	1	10	11	7
010	BH106_1.9-2.0	1	-	1	10	11	7
011	BH106_3.9-4.0	1	-	1	10	11	7
012	BH107_0.3-0.4	1	26	1	10	11	7
013	BH107_1.9-2.0	1	-	1	10	11	7
014	BH107_3.9-4.0	1	-	1	10	11	7
015	BH100_QD1	1	-	1	10	11	7
017	QTS1	-	-	-	-	11	-
018	QTB1	1	-	-	-	11	-

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

SAMPLE RECEIPT ADVICE

SE211528

CLIENT DETAILS

Client EI AUSTRALIA

Project E24847.E02 190 Waterloo Rd Greenacre

SUMMARY OF ANALYSIS

No.	Sample ID	Fibre Identification in soil	Trace Metals (Dissolved) in Water by ICPMS	TRH (Total Recoverable Hydrocarbons) in Water	VOCs in Water	Volatile Petroleum Hydrocarbons in Water
001	BH102_0.3-0.4	2	-	-	-	-
004	BH103_0.3-0.4	2	-	-	-	-
005	BH104_0.2-0.3	2	-	-	-	-
006	BH105_0.3-0.4	2	-	-	-	-
009	BH106_0.4-0.5	2	-	-	-	-
012	BH107_0.3-0.4	2	-	-	-	-
016	BH100_QR1	-	1	9	11	7

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

Appendix G – Laboratory Analytical Reports

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 251928

Client Details

Client	EI Australia
Attention	Emmanuel Woelders
Address	Suite 6.01, 55 Miller Street, Pyrmont, NSW, 2009

Sample Details

Your Reference	**E24847. E02**
Number of Samples	2 Soil
Date samples received	23/09/2020
Date completed instructions received	23/09/2020

Analysis Details

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

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

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

Report Details

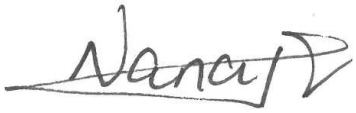
Date results requested by	30/09/2020
Date of Issue	28/09/2020

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Loren Bardwell, Senior Chemist
Manju Dewendrage, Chemist
Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		251928-1
Your Reference	UNITS	BH100_QT1
Date Sampled		22/09/2020
Type of sample		Soil
Date extracted	-	24/09/2020
Date analysed	-	25/09/2020
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<3
Surrogate aaa-Trifluorotoluene	%	101

svTRH (C10-C40) in Soil		
Our Reference		251928-1
Your Reference	UNITS	BH100_QT1
Date Sampled		22/09/2020
Type of sample		Soil
Date extracted	-	24/09/2020
Date analysed	-	25/09/2020
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	500
TRH >C_{10} -C_{16}	mg/kg	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50
TRH >C_{16} -C_{34}	mg/kg	450
TRH >C_{34} -C_{40}	mg/kg	410
Total +ve TRH (>C10-C40)	mg/kg	860
Surrogate o-Terphenyl	%	102

Acid Extractable metals in soil		
Our Reference		251928-1
Your Reference	UNITS	BH100_QT1
Date Sampled		22/09/2020
Type of sample		Soil
Date prepared	-	24/09/2020
Date analysed	-	24/09/2020
Lead	mg/kg	150

Moisture		
Our Reference		251928-1
Your Reference	UNITS	BH100_QT1
Date Sampled		22/09/2020
Type of sample		Soil
Date prepared	-	24/09/2020
Date analysed	-	25/09/2020
Moisture	%	19

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-AES.
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-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			24/09/2020	[NT]	[NT]	[NT]	[NT]	24/09/2020	[NT]
Date analysed	-			25/09/2020	[NT]	[NT]	[NT]	[NT]	25/09/2020	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	106	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	106	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	95	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	106	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	113	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	111	[NT]
naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	74	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			24/09/2020	[NT]	[NT]	[NT]	[NT]	24/09/2020	[NT]
Date analysed	-			25/09/2020	[NT]	[NT]	[NT]	[NT]	25/09/2020	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	126	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	91	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	98	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	126	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	91	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	98	[NT]
Surrogate o-Terphenyl	%		Org-020	90	[NT]	[NT]	[NT]	[NT]	104	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date prepared	-			24/09/2020	[NT]	[NT]	[NT]	[NT]	24/09/2020	[NT]
Date analysed	-			24/09/2020	[NT]	[NT]	[NT]	[NT]	24/09/2020	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Emmanuel Woelders
Client	EI AUSTRALIA
Address	SUITE 6.01 55 MILLER STREET PYRMONT NSW 2009
Telephone	61 2 95160722
Facsimile	(Not specified)
Email	emmanuel.woelders@eiaustralia.com.au
Project	**E24847.E02 190 Waterloo Rd Greenacre**
Order Number	**E24847.E02**
Samples	18

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE211528 R0**
Date Received	23/9/2020
Date Reported	30/9/2020

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

No respirable fibres detected in all soil samples using trace analysis technique.

Sample #4: Approx 9-10 x 2mm fibre bundles found loose in sample and asbestos found in approx 3x3x2mm cement sheet fragments

Asbestos analysed by Approved Identifier Yusuf Kuthpudin.

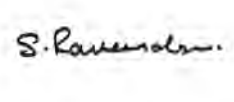
SIGNATORIES

Bennet LO
Senior Organic Chemist/Metals Chemist

Dong LIANG
Metals/Inorganics Team Leader

Kamrul AHSAN
Senior Chemist

Ly Kim HA
Organic Section Head



Ravee SIVASUBRAMANIAM
Hygiene Team Leader

VOC's in Soil [AN433] Tested: 24/9/2020

PARAMETER	UOM	LOR	BH102_0.3-0.4 SOIL - 22/9/2020 SE211528.001	BH102_1.5-1.6 SOIL - 22/9/2020 SE211528.002	BH102_3.6-3.7 SOIL - 22/9/2020 SE211528.003	BH103_0.3-0.4 SOIL - 22/9/2020 SE211528.004	BH104_0.2-0.3 SOIL - 22/9/2020 SE211528.005
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	BH105_0.3-0.4 SOIL - 22/9/2020 SE211528.006	BH105_1.9-2.0 SOIL - 22/9/2020 SE211528.007	BH105_3.9-4.0 SOIL - 22/9/2020 SE211528.008	BH106_0.4-0.5 SOIL - 22/9/2020 SE211528.009	BH106_1.9-2.0 SOIL - 22/9/2020 SE211528.010
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	BH106_3.9-4.0 SOIL - 22/9/2020 SE211528.011	BH107_0.3-0.4 SOIL - 22/9/2020 SE211528.012	BH107_1.9-2.0 SOIL - 22/9/2020 SE211528.013	BH107_3.9-4.0 SOIL - 22/9/2020 SE211528.014	BH100_QD1 SOIL - 22/9/2020 SE211528.015
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	QTS1 SOIL - 22/9/2020 SE211528.017	QTB1 SOIL - 22/9/2020 SE211528.018
Benzene	mg/kg	0.1	[87%]	<0.1
Toluene	mg/kg	0.1	[91%]	<0.1
Ethylbenzene	mg/kg	0.1	[93%]	<0.1
m/p-xylene	mg/kg	0.2	[94%]	<0.2
o-xylene	mg/kg	0.1	[94%]	<0.1
Total Xylenes	mg/kg	0.3	-	<0.3
Total BTEX	mg/kg	0.6	-	<0.6
Naphthalene	mg/kg	0.1	-	<0.1

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 24/9/2020

PARAMETER	UOM	LOR	BH102_0.3-0.4 SOIL - 22/9/2020 SE211528.001	BH102_1.5-1.6 SOIL - 22/9/2020 SE211528.002	BH102_3.6-3.7 SOIL - 22/9/2020 SE211528.003	BH103_0.3-0.4 SOIL - 22/9/2020 SE211528.004	BH104_0.2-0.3 SOIL - 22/9/2020 SE211528.005
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	BH105_0.3-0.4 SOIL - 22/9/2020 SE211528.006	BH105_1.9-2.0 SOIL - 22/9/2020 SE211528.007	BH105_3.9-4.0 SOIL - 22/9/2020 SE211528.008	BH106_0.4-0.5 SOIL - 22/9/2020 SE211528.009	BH106_1.9-2.0 SOIL - 22/9/2020 SE211528.010
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	BH106_3.9-4.0 SOIL - 22/9/2020 SE211528.011	BH107_0.3-0.4 SOIL - 22/9/2020 SE211528.012	BH107_1.9-2.0 SOIL - 22/9/2020 SE211528.013	BH107_3.9-4.0 SOIL - 22/9/2020 SE211528.014	BH100_QD1 SOIL - 22/9/2020 SE211528.015
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 24/9/2020

PARAMETER	UOM	LOR	BH102_0.3-0.4 SOIL - 22/9/2020 SE211528.001	BH102_1.5-1.6 SOIL - 22/9/2020 SE211528.002	BH102_3.6-3.7 SOIL - 22/9/2020 SE211528.003	BH103_0.3-0.4 SOIL - 22/9/2020 SE211528.004	BH104_0.2-0.3 SOIL - 22/9/2020 SE211528.005
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	**120**	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	**320**	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	**340**	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	**160**	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	**440**	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	**500**	<210

PARAMETER	UOM	LOR	BH105_0.3-0.4 SOIL - 22/9/2020 SE211528.006	BH105_1.9-2.0 SOIL - 22/9/2020 SE211528.007	BH105_3.9-4.0 SOIL - 22/9/2020 SE211528.008	BH106_0.4-0.5 SOIL - 22/9/2020 SE211528.009	BH106_1.9-2.0 SOIL - 22/9/2020 SE211528.010
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	BH106_3.9-4.0 SOIL - 22/9/2020 SE211528.011	BH107_0.3-0.4 SOIL - 22/9/2020 SE211528.012	BH107_1.9-2.0 SOIL - 22/9/2020 SE211528.013	BH107_3.9-4.0 SOIL - 22/9/2020 SE211528.014	BH100_QD1 SOIL - 22/9/2020 SE211528.015
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 24/9/2020

PARAMETER	UOM	LOR	BH102_0.3-0.4 SOIL - 22/9/2020 SE211528.001	BH103_0.3-0.4 SOIL - 22/9/2020 SE211528.004	BH104_0.2-0.3 SOIL - 22/9/2020 SE211528.005	BH105_0.3-0.4 SOIL - 22/9/2020 SE211528.006	BH106_0.4-0.5 SOIL - 22/9/2020 SE211528.009
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<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	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8	<0.8

PARAMETER	UOM	LOR	BH107_0.3-0.4 SOIL - 22/9/2020 SE211528.012
Naphthalene	mg/kg	0.1	**1.4**
2-methylnaphthalene	mg/kg	0.1	**1.1**
1-methylnaphthalene	mg/kg	0.1	**1.4**
Acenaphthylene	mg/kg	0.1	**1.3**
Acenaphthene	mg/kg	0.1	**1.3**
Fluorene	mg/kg	0.1	**1.3**
Phenanthrene	mg/kg	0.1	**1.2**
Anthracene	mg/kg	0.1	**1.6**
Fluoranthene	mg/kg	0.1	**1.4**
Pyrene	mg/kg	0.1	**1.4**
Benzo(a)anthracene	mg/kg	0.1	**1.1**
Chrysene	mg/kg	0.1	**1.2**
Benzo(b&j)fluoranthene	mg/kg	0.1	**1.3**
Benzo(k)fluoranthene	mg/kg	0.1	**1.2**
Benzo(a)pyrene	mg/kg	0.1	**1.3**
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	**1.1**
Dibenzo(ah)anthracene	mg/kg	0.1	**1.3**
Benzo(ghi)perylene	mg/kg	0.1	**1.2**
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	**3.1**
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	**3.1**
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	**3.1**
Total PAH (18)	mg/kg	0.8	**23**
Total PAH (NEPM/WHO 16)	mg/kg	0.8	**21**

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 24/9/2020

PARAMETER	UOM	LOR	BH102_0.3-0.4 SOIL - 22/9/2020 SE211528.001	BH102_1.5-1.6 SOIL - 22/9/2020 SE211528.002	BH102_3.6-3.7 SOIL - 22/9/2020 SE211528.003	BH103_0.3-0.4 SOIL - 22/9/2020 SE211528.004	BH104_0.2-0.3 SOIL - 22/9/2020 SE211528.005
Lead, Pb	mg/kg	1	5	11	15	110	1

PARAMETER	UOM	LOR	BH105_0.3-0.4 SOIL - 22/9/2020 SE211528.006	BH105_1.9-2.0 SOIL - 22/9/2020 SE211528.007	BH105_3.9-4.0 SOIL - 22/9/2020 SE211528.008	BH106_0.4-0.5 SOIL - 22/9/2020 SE211528.009	BH106_1.9-2.0 SOIL - 22/9/2020 SE211528.010
Lead, Pb	mg/kg	1	7	16	13	9	19

PARAMETER	UOM	LOR	BH106_3.9-4.0 SOIL - 22/9/2020 SE211528.011	BH107_0.3-0.4 SOIL - 22/9/2020 SE211528.012	BH107_1.9-2.0 SOIL - 22/9/2020 SE211528.013	BH107_3.9-4.0 SOIL - 22/9/2020 SE211528.014	BH100_QD1 SOIL - 22/9/2020 SE211528.015
Lead, Pb	mg/kg	1	12	3	12	14	170

Moisture Content [AN002] Tested: 24/9/2020

PARAMETER	UOM	LOR	BH102_0.3-0.4 SOIL - 22/9/2020 SE211528.001	BH102_1.5-1.6 SOIL - 22/9/2020 SE211528.002	BH102_3.6-3.7 SOIL - 22/9/2020 SE211528.003	BH103_0.3-0.4 SOIL - 22/9/2020 SE211528.004	BH104_0.2-0.3 SOIL - 22/9/2020 SE211528.005
% Moisture	%w/w	1	21.3	19.0	13.9	18.5	21.8

PARAMETER	UOM	LOR	BH105_0.3-0.4 SOIL - 22/9/2020 SE211528.006	BH105_1.9-2.0 SOIL - 22/9/2020 SE211528.007	BH105_3.9-4.0 SOIL - 22/9/2020 SE211528.008	BH106_0.4-0.5 SOIL - 22/9/2020 SE211528.009	BH106_1.9-2.0 SOIL - 22/9/2020 SE211528.010
% Moisture	%w/w	1	21.2	17.3	8.3	22.6	19.2

PARAMETER	UOM	LOR	BH106_3.9-4.0 SOIL - 22/9/2020 SE211528.011	BH107_0.3-0.4 SOIL - 22/9/2020 SE211528.012	BH107_1.9-2.0 SOIL - 22/9/2020 SE211528.013	BH107_3.9-4.0 SOIL - 22/9/2020 SE211528.014	BH100_QD1 SOIL - 22/9/2020 SE211528.015
% Moisture	%w/w	1	18.4	20.8	16.4	8.6	18.0

PARAMETER	UOM	LOR	QTB1 SOIL - 22/9/2020 SE211528.018
% Moisture	%w/w	1	<1.0

Fibre Identification in soil [AN602] Tested: 28/9/2020

PARAMETER	UOM	LOR	BH102_0.3-0.4 SOIL - 22/9/2020 SE211528.001	BH103_0.3-0.4 SOIL - 22/9/2020 SE211528.004	BH104_0.2-0.3 SOIL - 22/9/2020 SE211528.005	BH105_0.3-0.4 SOIL - 22/9/2020 SE211528.006	BH106_0.4-0.5 SOIL - 22/9/2020 SE211528.009
Asbestos Detected	No unit	-	No	Yes	No	No	No
Estimated Fibres*	%w/w	0.01	<0.01	**>0.01**	<0.01	<0.01	<0.01

PARAMETER	UOM	LOR	BH107_0.3-0.4 SOIL - 22/9/2020 SE211528.012
Asbestos Detected	No unit	-	No
Estimated Fibres*	%w/w	0.01	<0.01

VOCs in Water [AN433] Tested: 25/9/2020

PARAMETER	UOM	LOR	BH100_QR1 WATER - 22/9/2020 SE211528.016
Benzene	µg/L	0.5	<0.5
Toluene	µg/L	0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5
m/p-xylene	µg/L	1	<1
o-xylene	µg/L	0.5	<0.5
Total Xylenes	µg/L	1.5	<1.5
Total BTEX	µg/L	3	<3
Naphthalene	µg/L	0.5	<0.5

Volatile Petroleum Hydrocarbons in Water [AN433] Tested: 25/9/2020

PARAMETER	UOM	LOR	BH100_QR1 WATER - 22/9/2020 SE211528.016
TRH C6-C9	µg/L	40	<40
Benzene (F0)	µg/L	0.5	<0.5
TRH C6-C10	µg/L	50	<50
TRH C6-C10 minus BTEX (F1)	µg/L	50	<50

TRH (Total Recoverable Hydrocarbons) in Water [AN403] Tested: 25/9/2020

PARAMETER	UOM	LOR	BH100_QR1 WATER - 22/9/2020 SE211528.016
TRH C10-C14	µg/L	50	<50
TRH C15-C28	µg/L	200	<200
TRH C29-C36	µg/L	200	<200
TRH C37-C40	µg/L	200	<200
TRH >C10-C16	µg/L	60	<60
TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60
TRH >C16-C34 (F3)	µg/L	500	<500
TRH >C34-C40 (F4)	µg/L	500	<500
TRH C10-C40	µg/L	320	<320

Trace Metals (Dissolved) in Water by ICPMS [AN318] Tested: 24/9/2020

PARAMETER	UOM	LOR	BH100_QR1 WATER - 22/9/2020 SE211528.016
Lead, Pb	µg/L	1	**3**

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN020	Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
AN318	Determination of elements at trace level in waters by ICP-MS technique,, referenced to USEPA 6020B and USEPA 200.8 (5.4).
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoverable Hydrocarbons - Silica (TRH-Si) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents .
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken . This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup /fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN420	Carcinogenic PAHs may be expressed as Benzo(a)pyrene equivalents by applying the BaP toxicity equivalence factor (NEPM 1999, June 2013, B7). These can be reported as the individual PAHs and as a sum of carcinogenic PAHs. The sum is reported three ways, the first assuming all <LOR results are zero, the second assuming all < LOR results are half the LOR and the third assuming all <LOR results are the LOR.
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf) The fibres detected may or may not be asbestos fibres.
AN602	AS4964.2004 Method for the Qualitative Identification of Asbestos in Bulk Samples, Section 8.4, Trace Analysis Criteria, Note 4 states:"Depending upon sample condition and fibre type, the detection limit of this technique has been found to lie generally in the range of 1 in 1,000 to 1 in 10,000 parts by weight, equivalent to 1 to 0.1 g/kg."

AN602	The sample can be reported “no asbestos found at the reporting limit of 0.1 g/kg” (<0.01%w/w) where AN602 section 4.5 of this method has been followed, and if- (a) no trace asbestos fibres have been detected (i.e. no ‘respirable’ fibres): (b) the estimated weight of non-respirable asbestos fibre bundles and/or the estimated weight of asbestos in asbestos-containing materials are found to be less than 0.1g/kg: and (c) these non-respirable asbestos fibre bundles and/or the asbestos containing materials are only visible under stereo-microscope viewing conditions.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
***	Indicates that both * and ** apply.	LNR	Sample listed, but not received.		

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-qb/environment-health-and-safety.

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Emmanuel Woelders
Client	EI AUSTRALIA
Address	SUITE 6.01 55 MILLER STREET PYRMONT NSW 2009
Telephone	61 2 95160722
Facsimile	(Not specified)
Email	emmanuel.woelders@eiaustralia.com.au
Project	**E24847.E02 190 Waterloo Rd Greenacre**
Order Number	**E24847.E02**
Samples	6

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE211528 R0**
Date Received	23 Sep 2020
Date Reported	30 Sep 2020

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

No respirable fibres detected in all soil samples using trace analysis technique.

Sample #4: Approx 9-10 x 2mm fibre bundles found loose in sample and asbestos found in approx 3x3x2mm cement sheet fragments

Asbestos analysed by Approved Identifier Yusuf Kuthpudin.

SIGNATORIES

Bennet LO
Senior Organic Chemist/Metals Chemis

Kamrul AHSAN
Senior Chemist

Ly Kim HA
Organic Section Head

Ravee SIVASUBRAMANIAM
Hygiene Team Leader

ANALYTICAL REPORT

SE211528 R0

RESULTS

Fibre Identification in soil — Method AN602

Laboratory Reference	Client Reference	Matrix	Sample Description	Date Sampled	Fibre Identification	Est.%w/w*
SE211528.001	BH102_0.3-0.4	Soil	142g Clay, Sand, Rocks	22 Sep 2020	No Asbestos Found	<0.01
SE211528.004	BH103_0.3-0.4	Soil	263g Clay, Sand, Soil, Rocks	22 Sep 2020	Chrysotile & Crocidolite Asbestos Found Organic Fibres Detected	>0.01
SE211528.005	BH104_0.2-0.3	Soil	203g Clay, Sand, Rocks	22 Sep 2020	No Asbestos Found Organic Fibres Detected	<0.01
SE211528.006	BH105_0.3-0.4	Soil	225g Clay, Sand, Soil, Rocks	22 Sep 2020	No Asbestos Found	<0.01
SE211528.009	BH106_0.4-0.5	Soil	151g Clay, Sand, Soil, Rocks	22 Sep 2020	No Asbestos Found	<0.01
SE211528.012	BH107_0.3-0.4	Soil	224g Clay, Sand, Soil, Rocks	22 Sep 2020	No Asbestos Found	<0.01

METHOD SUMMARY

SE211528 R0

METHOD	METHODOLOGY SUMMARY
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf) The fibres detected may or may not be asbestos fibres.
AN602	AS4964.2004 Method for the Qualitative Identification of Asbestos in Bulk Samples , Section 8.4, Trace Analysis Criteria, Note 4 states:"Depending upon sample condition and fibre type, the detection limit of this technique has been found to lie generally in the range of 1 in 1,000 to 1 in 10,000 parts by weight, equivalent to 1 to 0.1 g/kg."
AN602	The sample can be reported “no asbestos found at the reporting limit of 0.1 g/kg” (<0.01%w/w) where AN602 section 4.5 of this method has been followed, and if- (a) no trace asbestos fibres have been detected (i.e. no ‘respirable ’ fibres): (b) the estimated weight of non-respirable asbestos fibre bundles and/or the estimated weight of asbestos in asbestos-containing materials are found to be less than 0.1g/kg: and (c) these non-respirable asbestos fibre bundles and/or the asbestos containing materials are only visible under stereo-microscope viewing conditions.

FOOTNOTES

Amosite	-	Brown Asbestos	NA	-	Not Analysed
Chrysotile	-	White Asbestos	LNR	-	Listed, Not Required
Crocidolite	-	Blue Asbestos	*	-	NATA accreditation does not cover the performance of this service .
Amphiboles	-	Amosite and/or Crocidolite	**	-	Indicative data, theoretical holding time exceeded.
			***	-	Indicates that both * and ** apply.

(In reference to soil samples only) This report does not comply with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment and Remediation and Management of Asbestos Contaminated sites in Western Australia - May 2009.

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.

Where reported: 'Asbestos Detected': Asbestos detected by polarised light microscopy, including dispersion staining.
Where reported: 'No Asbestos Found': No Asbestos Found by polarised light microscopy , including dispersion staining.
Where reported: 'UMF Detected': Mineral fibres of unknown type detected by polarised light microscopy, including dispersion staining. Confirmation by another independent analytical technique may be necessary.

Even after disintegration it can be very difficult, or impossible, to detect the presence of asbestos in some asbestos -containing bulk materials using polarised light microscopy. This is due to the low grade or small length or diameter of asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety .

Appendix H – QA/QC Assessment

Quality Assurance / Quality Control Program

Quality assurance comprises an assessment of the reliability of the field procedures and laboratory results against standard industry practices and the SAQP. A summary of the project QA/QC measures incorporated into this DSI is presented in **Table H-1**.

Table H-1 Summary of Project QA/QC Measures

Task	Description	Comments / Compliance with SOP or DQI
Field QA/QC		
General	Work was to be undertaken following standard field procedures which are based on industry accepted standard practice.	Yes. Soil samples were collected directly from the auger. Soil samples were placed in 250 gram glass jars, which were filled to minimise headspace, and sealed using Teflon-coated lids.
	All fieldwork was conducted / supervised by a suitably qualified and experienced person.	Yes.
Soil Screening with PID	The PID was serviced and calibrated as per manufacturer requirements. PID calibrated at the beginning of each day of fieldwork.	Yes. See **Appendix E** for calibration documentation.
Equipment Decontamination	Sampling equipment to be decontaminated after the collection of each soil sample by washing with detergent and potable water, followed by a final distilled water rinse. One rinsate blank would be collected and analysed for the primary contaminants. All results should be non-detect.	Yes. One rinsate (blank) sample was collected during the field work on 22 September 2020 (BH100_QR1). All results were non-detect, with the exception of lead with the concentration of 3 µg/L.
Transport	Samples were stored in chilled, insulated eskies and transported to the laboratories. To ensure the integrity of the samples from collection to receipt by the analytical laboratory, samples were sent by courier to the laboratories under 'chain of custody' describing sample preservation and transport duration.	Yes.
Trip Blank	Trip blank sample prepared and analysed by the primary laboratory for BTEX. Analytical results to be below the laboratory LOR, indicating satisfactory sample transport and handling conditions were achieved.	Yes. One trip blank sample (QTB1) was prepared by the primary laboratory (SGS) and analysed for BTEX during soil testing. Results were below the laboratory LOR, indicating that ideal sample transport and handling conditions were achieved (i.e. no cross-contamination occurred).
Trip Spike	Trip spike sample prepared and analysed by the primary laboratory for BTEX. Analytical results to be within 80-120% recovery, indicating satisfactory sample transport and handling conditions were achieved.	One trip spike sample (QTS1) was prepared and analysed by the primary laboratory (SGS) for BTEX. Recoveries were 72-119%, which complied with the DQI. It was therefore concluded that satisfactory sample transport and handling conditions were achieved (i.e. negligible loss of volatiles).

Task	Description	Comments / Compliance with SOP or DQI
Duplicates	Field duplicates to be analysed as follows (NEPC, 2013): ▪ intra-laboratory duplicates at a rate of 1 in 20 primary samples; and ▪ inter-laboratory duplicates at a rate of 1 in 20 primary samples. Field duplicate acceptable limits are 30-50% RPD, as stated by AS4482.1: 2005. RPDs that exceed this range may be considered acceptable where: ▪ Results are less than 10 times the LOR; ▪ Results are less than 20 times the LOR and the RPD is less than 50%; or ▪ Heterogeneous materials or volatile compounds are encountered. ▪ Non-compliance is to be documented in the report and the sample re-analysed or a higher level conservatively adopted.	Yes. Field QC duplicates are identified in **Table H-2** and calculated RPDs are included in the corresponding table in **Appendix B**. The required duplicate frequency of 1 per 20 primary samples was achieved. Generally, RPDs were <30%, in compliance with the DQI, with the exception of: ▪ F3 (129.87%) between sample BH103_0.3-0.4 and BH100_QD1; and ▪ F4 (87.72%) between samples BH103_0.3-0.4 and BH100_QT1. Variabilities were due to low analyte concentrations and/or sample heterogeneity.
Laboratory QA/QC		
Laboratory Analysis	The laboratories selected are NATA-accredited for the COPCs and perform their own internal QA/QC programs.	Yes. SGS - primary laboratory. Envirolab - secondary laboratory. Laboratory QA/QC measures were included in the analytical reports (**Appendix G**). Refer also to **Appendix I**.
	Appropriate detection limits were used for the analyses to be undertaken.	Yes. Practical Quantitation Limits for all tested parameters during the DSI are presented with the laboratory reports in **Appendix G**.
Holding Times	Holding times are the maximum permissible elapsed time in days from the collection of the sample to its extraction and/or analysis. All extraction and analyses should be completed within standard guidelines.	Yes.
Method Blanks	Each analysis procedure should be subject to method blank analysis. A method blank contains the reagents used to prepare the sample for analysis. The purpose is to check for contamination in the reagents and thereby assess potential bias in the sample analysis. The DQI is for method blank results for be <LOR.	Yes. All method blanks complied with the laboratory's DQI.

Task	Description	Comments / Compliance with SOP or DQI
Laboratory Duplicates	Laboratory duplicates are field samples that are analysed a number of times, to assess analytical precision. They are performed at a frequency of 1 per 10 primary samples. The DQIs are as per field duplicates, except where laboratory methodology (limitations) prevail.	Yes. Results for the majority of the laboratory duplicates were within the laboratory acceptance criteria as shown in the Laboratory DQO documents (Refer to **Appendices G** and **I**). Laboratory duplicates which failed acceptance criteria due to sample heterogeneity and/or low analyte concentrations.
Laboratory Control Standard	A laboratory control standard is a standard reference material, or selected primary standard. Its analysis helps confirm the analytical calibration. They are performed on a frequency of 1 per 20 samples, or at least one per analytical run. The DQI is usually 80-120% recovery.	Yes. All laboratory control samples were within acceptable ranges.
Matrix Spikes	Matrix spikes are field samples to which a predetermined (known) amount of primary standard is added. They are analysed for recovery of the known addition, as means to assess matrix interference. The DQI is 70-130% recovery, with duplicates having <50% RPD.	Yes. All spikes were within acceptable ranges.
Surrogate Spikes	Surrogate spikes provide a means of checking that no gross errors (significant analyte loss) occurred at any stage of the procedure. The DQI is 70-130% recovery of the surrogate.	Partially All surrogate spikes were within acceptable ranges, with the exception of PAHs in 5 samples.
Conclusion	The QA/QC indicators should either all comply with the required standards or showed no variations that would have no significant effect on the quality of the data.	Yes. Further assessment of the investigation QA/QC is presented in the following sections.

Field QA/QC

Field QC Duplicates

The field (intra- / inter- laboratory) duplicate samples collected during the investigation are identified in **Table H-2**. Inter-laboratory duplicates were analysed by the secondary laboratory, Envirolab

Table H-2 Field Duplicates

Matrix	Primary Sample	Blind Duplicate (Primary Lab)	Split Duplicate (Secondary Lab)	Total Duplicates
Soil	BH103_0.3-0.4	BH100_QD1	BH100_QT1	2

Field QC Summary

Review of the field data quality indicators is presented in **Table H-3** below.

Table H-3 Field Data Quality Indicators

QA Component	Data Quality Indicator(s)	Conformance
Accuracy – A measure of the closeness of reported data to the "true" value	SOPs appropriate and complied with	Yes
	Results for inter-laboratory (split field) duplicates acceptable	Yes
Precision – A measure of the variability (or reproducibility) of data	SOPs appropriate and complied with	Yes
	Results for intra-laboratory (blind field) duplicates acceptable	Yes
Completeness – A measure of the amount of useable data from a data collection activity	Each critical location sampled	Yes
	Samples collected at targeted locations and depth	Yes
	SAQP appropriate and complied with	Yes
	Experienced sampler	Yes
	Field documentation correct	Yes
Comparability – The confidence that data were equivalent for each sampling and analytical event	Same sampling method used on each occasion/location	Yes
	Experienced sampler	Yes
	Same type of samples collected (filtered, size, fractions)	Yes
Representativeness – The confidence that data were representative of each medium present onsite	Appropriate media sampled according to SAQP	Yes
	Each media identified in SAQP sampled	Yes
	Appropriate sample collection methodologies, handling, storage and preservation techniques used	Yes

Conclusion for the Field QA/QC

All field work, including equipment decontamination and sample preservation and transport, was conducted in accordance with the SAQP, which were devised with reference to industry-approved guidelines. Appropriate QC measures were integrated into each sampling event and the DQIs were met.

All samples, including field QC samples, were transported to the primary and secondary laboratories under refrigerated conditions, using strict COC procedures. Relevant documents (COC forms) were presented with the samples at the times of delivery. All supporting documents (COCs and SRAs) were completed in full and signed, where appropriate. EI considered the field QA/QC program carried out during the DSI to be appropriate.

Laboratory QA/QC

Laboratory Accreditation

Primary and intra-laboratory duplicate samples were analysed by SGS (located in Alexandria NSW), with inter-laboratory duplicate samples analysed by Envirolab (located in Chatswood NSW). All laboratories are accredited by NATA for the analyses undertaken.

Laboratory QC Summary

Review of the laboratory data quality indicators is presented in **Table H-4** below.

Table H-4 Laboratory Data Quality Indicators

QA Component	Data Quality Indicator(s)	Conformance
Completeness	All critical samples analysed according to SAQP and proposal	Yes
	All analytes analysed according to SAQP in proposal	Yes
	Appropriate methods and LORs	Yes
	Sample documentation complete	Yes
	Sample holding times complied with	Yes
Comparability	Sample analytical methods used (including clean-up)	Yes
	Same sample LORs (justify/ quantify if different)	Yes
	Same laboratories (justify/ quantify if different)	Yes
	Same units (justify/ quantify if different)	Yes
Representativeness	All key samples analysed according to SAQP in the proposal	Yes
Precision	Analysis of laboratory duplicates	Yes
	Analysis of field duplicates	Yes
	Analysis of laboratory-prepared volatile trip spikes	Yes
Accuracy	Analysis of field blanks	Yes
	Analysis of rinsate/ rinsate blanks	Yes
	Analysis of method blanks	Yes
	Analysis of matrix spikes	Yes
	Analysis of surrogate spikes	Yes
	Analysis of laboratory control samples	Yes

Conclusion for the Laboratory QA/QC

All contracted laboratories (SGS and Envirolab) were accredited by NATA for the analyses undertaken. All analytical procedures used were industry recognised and endorsed standard methods. Appropriate QC measures were integrated into each analytical batch and the DQIs were met, or if not, the variability was suitably justified.

All final reports were submitted in full and included all requested analyses, as per the signed COC forms. EI considered the laboratory QA/QC programs carried out during the DSI to be appropriate.

Summary of Project QA/QC

The sampling (including sample preservation, transport and decontamination procedures) and laboratory methods followed during this investigation were consistent with EI protocols. The project DQOs specified in **Section 5.2**, **Table 5-1** were considered to have been achieved. The adopted QA/QC program ensured that the data collated during the DSI were accurate, precise and representative of the site condition. It was therefore considered that the data were sufficiently precise and accurate and that the results could be used for DSI interpretative purposes.

Appendix I – Laboratory QA/QC and DQOs

STATEMENT OF QA/QC PERFORMANCE

SE211528 R0

CLIENT DETAILS

Contact	Emmanuel Woelders
Client	EI AUSTRALIA
Address	SUITE 6.01 55 MILLER STREET PYRMONT NSW 2009
Telephone	61 2 95160722
Facsimile	(Not specified)
Email	emmanuel.woelders@eiaustralia.com.au
Project	**E24847.E02 190 Waterloo Rd Greenacre**
Order Number	**E24847.E02**
Samples	18

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE211528 R0**
Date Received	23 Sep 2020
Date Reported	30 Sep 2020

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Surrogate	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	5 items
Duplicate	Volatile Petroleum Hydrocarbons in Water	2 items

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	17 Soil, 1 Water
Date documentation received	23/9/2020	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	7.2°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

HOLDING TIME SUMMARY

SE211528 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

Fibre Identification in soil

Method: ME-(AU)-[ENV]AN602

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH102_0.3-0.4	SE211528.001	LB210105	22 Sep 2020	23 Sep 2020	22 Sep 2021	28 Sep 2020	22 Sep 2021	29 Sep 2020
BH103_0.3-0.4	SE211528.004	LB210105	22 Sep 2020	23 Sep 2020	22 Sep 2021	28 Sep 2020	22 Sep 2021	29 Sep 2020
BH104_0.2-0.3	SE211528.005	LB210105	22 Sep 2020	23 Sep 2020	22 Sep 2021	28 Sep 2020	22 Sep 2021	29 Sep 2020
BH105_0.3-0.4	SE211528.006	LB210105	22 Sep 2020	23 Sep 2020	22 Sep 2021	28 Sep 2020	22 Sep 2021	29 Sep 2020
BH106_0.4-0.5	SE211528.009	LB210105	22 Sep 2020	23 Sep 2020	22 Sep 2021	28 Sep 2020	22 Sep 2021	29 Sep 2020
BH107_0.3-0.4	SE211528.012	LB210105	22 Sep 2020	23 Sep 2020	22 Sep 2021	28 Sep 2020	22 Sep 2021	29 Sep 2020

Moisture Content

Method: ME-(AU)-[ENV]AN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH102_0.3-0.4	SE211528.001	LB209945	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	29 Sep 2020	29 Sep 2020
BH102_1.5-1.6	SE211528.002	LB209945	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	29 Sep 2020	29 Sep 2020
BH102_3.6-3.7	SE211528.003	LB209945	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	29 Sep 2020	29 Sep 2020
BH103_0.3-0.4	SE211528.004	LB209945	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	29 Sep 2020	29 Sep 2020
BH104_0.2-0.3	SE211528.005	LB209945	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	29 Sep 2020	29 Sep 2020
BH105_0.3-0.4	SE211528.006	LB209945	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	29 Sep 2020	29 Sep 2020
BH105_1.9-2.0	SE211528.007	LB209945	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	29 Sep 2020	29 Sep 2020
BH105_3.9-4.0	SE211528.008	LB209945	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	29 Sep 2020	29 Sep 2020
BH106_0.4-0.5	SE211528.009	LB209945	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	29 Sep 2020	29 Sep 2020
BH106_1.9-2.0	SE211528.010	LB209945	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	29 Sep 2020	29 Sep 2020
BH106_3.9-4.0	SE211528.011	LB209945	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	29 Sep 2020	29 Sep 2020
BH107_0.3-0.4	SE211528.012	LB209945	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	29 Sep 2020	29 Sep 2020
BH107_1.9-2.0	SE211528.013	LB209945	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	29 Sep 2020	29 Sep 2020
BH107_3.9-4.0	SE211528.014	LB209945	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	29 Sep 2020	29 Sep 2020
BH100_QD1	SE211528.015	LB209945	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	29 Sep 2020	29 Sep 2020
QTB1	SE211528.018	LB209945	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	29 Sep 2020	29 Sep 2020

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH102_0.3-0.4	SE211528.001	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	30 Sep 2020
BH102_1.5-1.6	SE211528.002	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	30 Sep 2020
BH102_3.6-3.7	SE211528.003	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	30 Sep 2020
BH103_0.3-0.4	SE211528.004	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	30 Sep 2020
BH104_0.2-0.3	SE211528.005	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	30 Sep 2020
BH105_0.3-0.4	SE211528.006	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	30 Sep 2020
BH105_1.9-2.0	SE211528.007	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	30 Sep 2020
BH105_3.9-4.0	SE211528.008	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	30 Sep 2020
BH106_0.4-0.5	SE211528.009	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	30 Sep 2020
BH106_1.9-2.0	SE211528.010	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	30 Sep 2020
BH106_3.9-4.0	SE211528.011	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	30 Sep 2020
BH107_0.3-0.4	SE211528.012	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	30 Sep 2020
BH107_1.9-2.0	SE211528.013	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	30 Sep 2020
BH107_3.9-4.0	SE211528.014	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	30 Sep 2020
BH100_QD1	SE211528.015	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	30 Sep 2020

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH102_0.3-0.4	SE211528.001	LB209963	22 Sep 2020	23 Sep 2020	21 Mar 2021	24 Sep 2020	21 Mar 2021	29 Sep 2020
BH102_1.5-1.6	SE211528.002	LB209963	22 Sep 2020	23 Sep 2020	21 Mar 2021	24 Sep 2020	21 Mar 2021	29 Sep 2020
BH102_3.6-3.7	SE211528.003	LB209963	22 Sep 2020	23 Sep 2020	21 Mar 2021	24 Sep 2020	21 Mar 2021	29 Sep 2020
BH103_0.3-0.4	SE211528.004	LB209963	22 Sep 2020	23 Sep 2020	21 Mar 2021	24 Sep 2020	21 Mar 2021	29 Sep 2020
BH104_0.2-0.3	SE211528.005	LB209963	22 Sep 2020	23 Sep 2020	21 Mar 2021	24 Sep 2020	21 Mar 2021	29 Sep 2020
BH105_0.3-0.4	SE211528.006	LB209963	22 Sep 2020	23 Sep 2020	21 Mar 2021	24 Sep 2020	21 Mar 2021	29 Sep 2020
BH105_1.9-2.0	SE211528.007	LB209963	22 Sep 2020	23 Sep 2020	21 Mar 2021	24 Sep 2020	21 Mar 2021	29 Sep 2020
BH105_3.9-4.0	SE211528.008	LB209963	22 Sep 2020	23 Sep 2020	21 Mar 2021	24 Sep 2020	21 Mar 2021	29 Sep 2020
BH106_0.4-0.5	SE211528.009	LB209963	22 Sep 2020	23 Sep 2020	21 Mar 2021	24 Sep 2020	21 Mar 2021	29 Sep 2020
BH106_1.9-2.0	SE211528.010	LB209963	22 Sep 2020	23 Sep 2020	21 Mar 2021	24 Sep 2020	21 Mar 2021	29 Sep 2020
BH106_3.9-4.0	SE211528.011	LB209963	22 Sep 2020	23 Sep 2020	21 Mar 2021	24 Sep 2020	21 Mar 2021	29 Sep 2020
BH107_0.3-0.4	SE211528.012	LB209963	22 Sep 2020	23 Sep 2020	21 Mar 2021	24 Sep 2020	21 Mar 2021	29 Sep 2020
BH107_1.9-2.0	SE211528.013	LB209963	22 Sep 2020	23 Sep 2020	21 Mar 2021	24 Sep 2020	21 Mar 2021	29 Sep 2020
BH107_3.9-4.0	SE211528.014	LB209963	22 Sep 2020	23 Sep 2020	21 Mar 2021	24 Sep 2020	21 Mar 2021	29 Sep 2020
BH100_QD1	SE211528.015	LB209963	22 Sep 2020	23 Sep 2020	21 Mar 2021	24 Sep 2020	21 Mar 2021	29 Sep 2020

HOLDING TIME SUMMARY

SE211528 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH100_QR1	SE211528.016	LB209926	22 Sep 2020	23 Sep 2020	21 Mar 2021	24 Sep 2020	21 Mar 2021	25 Sep 2020

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH102_0.3-0.4	SE211528.001	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH102_1.5-1.6	SE211528.002	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH102_3.6-3.7	SE211528.003	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH103_0.3-0.4	SE211528.004	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH104_0.2-0.3	SE211528.005	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH105_0.3-0.4	SE211528.006	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH105_1.9-2.0	SE211528.007	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH105_3.9-4.0	SE211528.008	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH106_0.4-0.5	SE211528.009	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH106_1.9-2.0	SE211528.010	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH106_3.9-4.0	SE211528.011	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH107_0.3-0.4	SE211528.012	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH107_1.9-2.0	SE211528.013	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH107_3.9-4.0	SE211528.014	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH100_QD1	SE211528.015	LB209938	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH100_QR1	SE211528.016	LB209993	22 Sep 2020	23 Sep 2020	29 Sep 2020	25 Sep 2020	04 Nov 2020	28 Sep 2020

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH102_0.3-0.4	SE211528.001	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH102_1.5-1.6	SE211528.002	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH102_3.6-3.7	SE211528.003	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH103_0.3-0.4	SE211528.004	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH104_0.2-0.3	SE211528.005	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH105_0.3-0.4	SE211528.006	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH105_1.9-2.0	SE211528.007	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH105_3.9-4.0	SE211528.008	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH106_0.4-0.5	SE211528.009	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH106_1.9-2.0	SE211528.010	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH106_3.9-4.0	SE211528.011	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH107_0.3-0.4	SE211528.012	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH107_1.9-2.0	SE211528.013	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH107_3.9-4.0	SE211528.014	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH100_QD1	SE211528.015	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
QTS1	SE211528.017	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
QTB1	SE211528.018	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH100_QR1	SE211528.016	LB210036	22 Sep 2020	23 Sep 2020	29 Sep 2020	25 Sep 2020	04 Nov 2020	28 Sep 2020

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH102_0.3-0.4	SE211528.001	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH102_1.5-1.6	SE211528.002	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH102_3.6-3.7	SE211528.003	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH103_0.3-0.4	SE211528.004	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH104_0.2-0.3	SE211528.005	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH105_0.3-0.4	SE211528.006	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH105_1.9-2.0	SE211528.007	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH105_3.9-4.0	SE211528.008	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH106_0.4-0.5	SE211528.009	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020

HOLDING TIME SUMMARY

SE211528 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

Volatile Petroleum Hydrocarbons in Soil (continued) — **Method: ME-(AU)-[ENV]AN433**

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH106_1.9-2.0	SE211528.010	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH106_3.9-4.0	SE211528.011	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH107_0.3-0.4	SE211528.012	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH107_1.9-2.0	SE211528.013	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH107_3.9-4.0	SE211528.014	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
BH100_QD1	SE211528.015	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
QTS1	SE211528.017	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020
QTB1	SE211528.018	LB209931	22 Sep 2020	23 Sep 2020	06 Oct 2020	24 Sep 2020	03 Nov 2020	29 Sep 2020

Volatile Petroleum Hydrocarbons in Water — **Method: ME-(AU)-[ENV]AN433**

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH100_QR1	SE211528.016	LB210036	22 Sep 2020	23 Sep 2020	29 Sep 2020	25 Sep 2020	04 Nov 2020	28 Sep 2020

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH102_0.3-0.4	SE211528.001	%	70 - 130%	61 ①
	BH103_0.3-0.4	SE211528.004	%	70 - 130%	68 ①
	BH104_0.2-0.3	SE211528.005	%	70 - 130%	62 ①
	BH105_0.3-0.4	SE211528.006	%	70 - 130%	66 ①
	BH106_0.4-0.5	SE211528.009	%	70 - 130%	62 ①
	BH107_0.3-0.4	SE211528.012	%	70 - 130%	109
d14-p-terphenyl (Surrogate)	BH102_0.3-0.4	SE211528.001	%	70 - 130%	85
	BH103_0.3-0.4	SE211528.004	%	70 - 130%	94
	BH104_0.2-0.3	SE211528.005	%	70 - 130%	101
	BH105_0.3-0.4	SE211528.006	%	70 - 130%	83
	BH106_0.4-0.5	SE211528.009	%	70 - 130%	100
	BH107_0.3-0.4	SE211528.012	%	70 - 130%	103
d5-nitrobenzene (Surrogate)	BH102_0.3-0.4	SE211528.001	%	70 - 130%	74
	BH103_0.3-0.4	SE211528.004	%	70 - 130%	78
	BH104_0.2-0.3	SE211528.005	%	70 - 130%	71
	BH105_0.3-0.4	SE211528.006	%	70 - 130%	76
	BH106_0.4-0.5	SE211528.009	%	70 - 130%	72
	BH107_0.3-0.4	SE211528.012	%	70 - 130%	92

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH102_0.3-0.4	SE211528.001	%	60 - 130%	74
	BH102_1.5-1.6	SE211528.002	%	60 - 130%	81
	BH102_3.6-3.7	SE211528.003	%	60 - 130%	75
	BH103_0.3-0.4	SE211528.004	%	60 - 130%	77
	BH104_0.2-0.3	SE211528.005	%	60 - 130%	72
	BH105_0.3-0.4	SE211528.006	%	60 - 130%	76
	BH105_1.9-2.0	SE211528.007	%	60 - 130%	79
	BH105_3.9-4.0	SE211528.008	%	60 - 130%	79
	BH106_0.4-0.5	SE211528.009	%	60 - 130%	78
	BH106_1.9-2.0	SE211528.010	%	60 - 130%	75
	BH106_3.9-4.0	SE211528.011	%	60 - 130%	73
	BH107_0.3-0.4	SE211528.012	%	60 - 130%	72
	BH107_1.9-2.0	SE211528.013	%	60 - 130%	76
	BH107_3.9-4.0	SE211528.014	%	60 - 130%	79
	BH100_QD1	SE211528.015	%	60 - 130%	75
	QTS1	SE211528.017	%	60 - 130%	71
	QTB1	SE211528.018	%	60 - 130%	76
d4-1,2-dichloroethane (Surrogate)	BH102_0.3-0.4	SE211528.001	%	60 - 130%	95
	BH102_1.5-1.6	SE211528.002	%	60 - 130%	100
	BH102_3.6-3.7	SE211528.003	%	60 - 130%	96
	BH103_0.3-0.4	SE211528.004	%	60 - 130%	98
	BH104_0.2-0.3	SE211528.005	%	60 - 130%	94
	BH105_0.3-0.4	SE211528.006	%	60 - 130%	96
	BH105_1.9-2.0	SE211528.007	%	60 - 130%	102
	BH105_3.9-4.0	SE211528.008	%	60 - 130%	104
	BH106_0.4-0.5	SE211528.009	%	60 - 130%	102
	BH106_1.9-2.0	SE211528.010	%	60 - 130%	99
	BH106_3.9-4.0	SE211528.011	%	60 - 130%	92
	BH107_0.3-0.4	SE211528.012	%	60 - 130%	93
	BH107_1.9-2.0	SE211528.013	%	60 - 130%	97
	BH107_3.9-4.0	SE211528.014	%	60 - 130%	106
	BH100_QD1	SE211528.015	%	60 - 130%	95
	QTS1	SE211528.017	%	60 - 130%	103
	QTB1	SE211528.018	%	60 - 130%	101
d8-toluene (Surrogate)	BH102_0.3-0.4	SE211528.001	%	60 - 130%	98
	BH102_1.5-1.6	SE211528.002	%	60 - 130%	103
	BH102_3.6-3.7	SE211528.003	%	60 - 130%	99
	BH103_0.3-0.4	SE211528.004	%	60 - 130%	102
	BH104_0.2-0.3	SE211528.005	%	60 - 130%	97
	BH105_0.3-0.4	SE211528.006	%	60 - 130%	100

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
d8-toluene (Surrogate)	BH105_1.9-2.0	SE211528.007	%	60 - 130%	105
	BH105_3.9-4.0	SE211528.008	%	60 - 130%	108
	BH106_0.4-0.5	SE211528.009	%	60 - 130%	104
	BH106_1.9-2.0	SE211528.010	%	60 - 130%	101
	BH106_3.9-4.0	SE211528.011	%	60 - 130%	95
	BH107_0.3-0.4	SE211528.012	%	60 - 130%	96
	BH107_1.9-2.0	SE211528.013	%	60 - 130%	99
	BH107_3.9-4.0	SE211528.014	%	60 - 130%	107
	BH100_QD1	SE211528.015	%	60 - 130%	98
	QTS1	SE211528.017	%	60 - 130%	104
	QTB1	SE211528.018	%	60 - 130%	105

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH100_QR1	SE211528.016	%	40 - 130%	103
d4-1,2-dichloroethane (Surrogate)	BH100_QR1	SE211528.016	%	40 - 130%	98
d8-toluene (Surrogate)	BH100_QR1	SE211528.016	%	40 - 130%	101

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH102_0.3-0.4	SE211528.001	%	60 - 130%	74
	BH102_1.5-1.6	SE211528.002	%	60 - 130%	81
	BH102_3.6-3.7	SE211528.003	%	60 - 130%	75
	BH103_0.3-0.4	SE211528.004	%	60 - 130%	77
	BH104_0.2-0.3	SE211528.005	%	60 - 130%	72
	BH105_0.3-0.4	SE211528.006	%	60 - 130%	76
	BH105_1.9-2.0	SE211528.007	%	60 - 130%	79
	BH105_3.9-4.0	SE211528.008	%	60 - 130%	79
	BH106_0.4-0.5	SE211528.009	%	60 - 130%	78
	BH106_1.9-2.0	SE211528.010	%	60 - 130%	75
	BH106_3.9-4.0	SE211528.011	%	60 - 130%	73
	BH107_0.3-0.4	SE211528.012	%	60 - 130%	72
	BH107_1.9-2.0	SE211528.013	%	60 - 130%	76
	BH107_3.9-4.0	SE211528.014	%	60 - 130%	79
	BH100_QD1	SE211528.015	%	60 - 130%	75
d4-1,2-dichloroethane (Surrogate)	BH102_0.3-0.4	SE211528.001	%	60 - 130%	95
	BH102_1.5-1.6	SE211528.002	%	60 - 130%	100
	BH102_3.6-3.7	SE211528.003	%	60 - 130%	96
	BH103_0.3-0.4	SE211528.004	%	60 - 130%	98
	BH104_0.2-0.3	SE211528.005	%	60 - 130%	94
	BH105_0.3-0.4	SE211528.006	%	60 - 130%	96
	BH105_1.9-2.0	SE211528.007	%	60 - 130%	102
	BH105_3.9-4.0	SE211528.008	%	60 - 130%	104
	BH106_0.4-0.5	SE211528.009	%	60 - 130%	102
	BH106_1.9-2.0	SE211528.010	%	60 - 130%	99
	BH106_3.9-4.0	SE211528.011	%	60 - 130%	92
	BH107_0.3-0.4	SE211528.012	%	60 - 130%	93
	BH107_1.9-2.0	SE211528.013	%	60 - 130%	97
	BH107_3.9-4.0	SE211528.014	%	60 - 130%	106
	BH100_QD1	SE211528.015	%	60 - 130%	95
d8-toluene (Surrogate)	BH102_0.3-0.4	SE211528.001	%	60 - 130%	98
	BH102_1.5-1.6	SE211528.002	%	60 - 130%	103
	BH102_3.6-3.7	SE211528.003	%	60 - 130%	99
	BH103_0.3-0.4	SE211528.004	%	60 - 130%	102
	BH104_0.2-0.3	SE211528.005	%	60 - 130%	97
	BH105_0.3-0.4	SE211528.006	%	60 - 130%	100
	BH105_1.9-2.0	SE211528.007	%	60 - 130%	105
	BH105_3.9-4.0	SE211528.008	%	60 - 130%	108
	BH106_0.4-0.5	SE211528.009	%	60 - 130%	104
	BH106_1.9-2.0	SE211528.010	%	60 - 130%	101
	BH106_3.9-4.0	SE211528.011	%	60 - 130%	95
	BH107_0.3-0.4	SE211528.012	%	60 - 130%	96

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Volatile Petroleum Hydrocarbons in Soil (continued)

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
d8-toluene (Surrogate)	BH107_1.9-2.0	SE211528.013	%	60 - 130%	99
	BH107_3.9-4.0	SE211528.014	%	60 - 130%	107
	BH100_QD1	SE211528.015	%	60 - 130%	98

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH100_QR1	SE211528.016	%	40 - 130%	103
d4-1,2-dichloroethane (Surrogate)	BH100_QR1	SE211528.016	%	60 - 130%	98
d8-toluene (Surrogate)	BH100_QR1	SE211528.016	%	40 - 130%	101

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB209938.001		Naphthalene	mg/kg	0.1	<0.1
		2-methylnaphthalene	mg/kg	0.1	<0.1
		1-methylnaphthalene	mg/kg	0.1	<0.1
		Acenaphthylene	mg/kg	0.1	<0.1
		Acenaphthene	mg/kg	0.1	<0.1
		Fluorene	mg/kg	0.1	<0.1
		Phenanthrene	mg/kg	0.1	<0.1
		Anthracene	mg/kg	0.1	<0.1
		Fluoranthene	mg/kg	0.1	<0.1
		Pyrene	mg/kg	0.1	<0.1
		Benzo(a)anthracene	mg/kg	0.1	<0.1
		Chrysene	mg/kg	0.1	<0.1
		Benzo(a)pyrene	mg/kg	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
		Benzo(ghi)perylene	mg/kg	0.1	<0.1
		Total PAH (18)	mg/kg	0.8	<0.8
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	73
		2-fluorobiphenyl (Surrogate)	%	-	71
		d14-p-terphenyl (Surrogate)	%	-	93

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result
LB209963.001	Lead, Pb	mg/kg	1	<1

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result
LB209926.001	Lead, Pb	µg/L	1	<1

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB209938.001	TRH C10-C14	mg/kg	20	<20
	TRH C15-C28	mg/kg	45	<45
	TRH C29-C36	mg/kg	45	<45
	TRH C37-C40	mg/kg	100	<100
	TRH C10-C36 Total	mg/kg	110	<110

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB209993.001	TRH C10-C14	µg/L	50	<50
	TRH C15-C28	µg/L	200	<200
	TRH C29-C36	µg/L	200	<200
	TRH C37-C40	µg/L	200	<200

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB209931.001	Monocyclic Aromatic Hydrocarbons	Benzene	mg/kg	0.1	<0.1
		Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene	mg/kg	0.1	<0.1
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	108
		d8-toluene (Surrogate)	%	-	112
		Bromofluorobenzene (Surrogate)	%	-	89
	Totals	Total BTEX	mg/kg	0.6	<0.6

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Number	Parameter	Units	LOR

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

VOCs in Water (continued)

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB210036.001	Monocyclic Aromatic Hydrocarbons	Benzene	µg/L	0.5	<0.5
		Toluene	µg/L	0.5	<0.5
		Ethylbenzene	µg/L	0.5	<0.5
		m/p-xylene	µg/L	1	<1
		o-xylene	µg/L	0.5	<0.5
	Polycyclic VOCs	Naphthalene	µg/L	0.5	<0.5
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	76
		d8-toluene (Surrogate)	%	-	97
		Bromofluorobenzene (Surrogate)	%	-	101

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB209931.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	108

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB210036.001		TRH C6-C9	µg/L	40	<40
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	76
		d8-toluene (Surrogate)	%	-	97
		Bromofluorobenzene (Surrogate)	%	-	101

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Moisture Content

Method: ME-(AU)-[ENV]AN002

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE211528.010	LB209945.011	% Moisture	%w/w	1	19.2	19.4	35	1

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE211528.010	LB209963.014	Lead, Pb	mg/kg	1	19	21	35	9
SE211566.008	LB209963.024	Lead, Pb	mg/kg	1	7	7	44	4

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE211483.005	LB209926.014	Lead, Pb	µg/L	1	<1	<1	200	0
SE211528.016	LB209926.017	Lead, Pb	µg/L	1	3	3	53	1

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE211528.010	LB209938.014		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0
SE211528.014	LB209938.022		TRH C10-C14	mg/kg	20	<20	0	200	0
			TRH C15-C28	mg/kg	45	<45	0	200	0
			TRH C29-C36	mg/kg	45	<45	0	200	0
			TRH C37-C40	mg/kg	100	<100	0	200	0
			TRH C10-C36 Total	mg/kg	110	<110	0	200	0
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	0	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	0	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	0	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	0	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	0	200	0

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE211571.008	LB209993.023		TRH C10-C14	µg/L	50	<50	0	200	0
			TRH C15-C28	µg/L	200	<200	0	200	0
			TRH C29-C36	µg/L	200	<200	0	200	0
			TRH C37-C40	µg/L	200	<200	0	200	0
			TRH C10-C40	µg/L	320	<320	0	200	0
		TRH F Bands	TRH >C10-C16	µg/L	60	<60	0	200	0
			TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60	0	200	0
			TRH >C16-C34 (F3)	µg/L	500	<500	0	200	0
			TRH >C34-C40 (F4)	µg/L	500	<500	0	200	0

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE211528.010	LB209931.014	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.9	9.8	50	0
			d8-toluene (Surrogate)	mg/kg	-	10.1	10.1	50	0
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.5	7.5	50	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE211528.010	LB209931.014	Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0
SE211528.014	LB209931.023	Monocyclic	Benzene	mg/kg	0.1	<0.1	0.0024344946	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	0.0155435369	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	0.0100842045	200	0
			m/p-xylene	mg/kg	0.2	<0.2	0.0177493492	200	0
			o-xylene	mg/kg	0.1	<0.1	0.0036621792	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	0.0013999362	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.6	10.079385928(	50	5
			d8-toluene (Surrogate)	mg/kg	-	10.7	10.3051708223	50	3
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.9	7.6293973701	50	3
		Totals	Total Xylenes	mg/kg	0.3	<0.3	0.0214115284	200	0
			Total BTEX	mg/kg	0.6	<0.6	0	200	0

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE211528.010	LB209931.014		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.9	9.8	30	0
			d8-toluene (Surrogate)	mg/kg	-	10.1	10.1	30	0
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.5	7.5	30	0
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0
SE211528.014	LB209931.023		TRH C6-C10	mg/kg	25	<25	0	200	0
			TRH C6-C9	mg/kg	20	<20	0	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.6	10.079385928(	30	5
			d8-toluene (Surrogate)	mg/kg	-	10.7	10.3051708223	30	3
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.9	7.6293973701	30	3
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	0.0024344946	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	0	200	0

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE211396.001	LB210036.024		TRH C6-C10	µg/L	50	<50	36.3428973924	200	0
			TRH C6-C9	µg/L	40	<40	30.9762124544	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	8.5	9.9931420384	30	16
			d8-toluene (Surrogate)	µg/L	-	8.9	9.9748293825	30	12
			Bromofluorobenzene (Surrogate)	µg/L	-	10.2	10.304180993(	30	1
		VPH F Bands	Benzene (F0)	µg/L	0.5	1.7	1.6813671432	59	3
			TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	34.6615302492	200	0
SE211425.001	LB210036.025		TRH C6-C10	µg/L	50	310	210	49	36
			TRH C6-C9	µg/L	40	290	200	46	37
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	7.4	10.5	30	35 ②
			d8-toluene (Surrogate)	µg/L	-	7.0	10.0	30	35 ②
			Bromofluorobenzene (Surrogate)	µg/L	-	10.9	10.8	30	1
		VPH F Bands	Benzene (F0)	µg/L	0.5	0.1020131869	0	200	0
			TRH C6-C10 minus BTEX (F1)	µg/L	50	300	210	49	37

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB209938.002		Naphthalene	mg/kg	0.1	4.1	4	60 - 140	103
		Acenaphthylene	mg/kg	0.1	3.9	4	60 - 140	97
		Acenaphthene	mg/kg	0.1	4.3	4	60 - 140	108
		Phenanthrene	mg/kg	0.1	4.2	4	60 - 140	106
		Anthracene	mg/kg	0.1	4.7	4	60 - 140	118
		Fluoranthene	mg/kg	0.1	4.1	4	60 - 140	103
		Pyrene	mg/kg	0.1	4.6	4	60 - 140	116
		Benzo(a)pyrene	mg/kg	0.1	5.0	4	60 - 140	124
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	75
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	80
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	77

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB209963.002	Lead, Pb	mg/kg	1	90	89.9	80 - 120	100

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB209926.002	Lead, Pb	µg/L	1	19	20	80 - 120	93

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB209938.002		TRH C10-C14	mg/kg	20	41	40	60 - 140	103
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	88
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	73
	TRH F Bands	TRH >C10-C16	mg/kg	25	41	40	60 - 140	103
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	78
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	75

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB209993.002		TRH C10-C14	µg/L	50	1100	1200	60 - 140	95
		TRH C15-C28	µg/L	200	1300	1200	60 - 140	110
		TRH C29-C36	µg/L	200	1400	1200	60 - 140	114
	TRH F Bands	TRH >C10-C16	µg/L	60	1200	1200	60 - 140	101
		TRH >C16-C34 (F3)	µg/L	500	1500	1200	60 - 140	123
		TRH >C34-C40 (F4)	µg/L	500	640	600	60 - 140	106

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB209931.002	Monocyclic	Benzene	mg/kg	0.1	3.9	5	60 - 140	79
	Aromatic	Toluene	mg/kg	0.1	4.0	5	60 - 140	79
		Ethylbenzene	mg/kg	0.1	4.0	5	60 - 140	80
		m/p-xylene	mg/kg	0.2	8.1	10	60 - 140	81
		o-xylene	mg/kg	0.1	4.1	5	60 - 140	81
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.4	10	70 - 130	104
		d8-toluene (Surrogate)	mg/kg	-	10.6	10	70 - 130	106
		Bromofluorobenzene (Surrogate)	mg/kg	-	7.3	10	70 - 130	73

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB210036.002	Monocyclic	Benzene	µg/L	0.5	46	45.45	60 - 140	102
	Aromatic	Toluene	µg/L	0.5	43	45.45	60 - 140	95
		Ethylbenzene	µg/L	0.5	50	45.45	60 - 140	111
		m/p-xylene	µg/L	1	100	90.9	60 - 140	110
		o-xylene	µg/L	0.5	50	45.45	60 - 140	110
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	8.0	10	60 - 140	80
		d8-toluene (Surrogate)	µg/L	-	8.0	10	70 - 130	80
		Bromofluorobenzene (Surrogate)	µg/L	-	10.0	10	70 - 130	100

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Volatile Petroleum Hydrocarbons in Soil — Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB209931.002		TRH C6-C10	mg/kg	25	84	92.5	60 - 140	90
		TRH C6-C9	mg/kg	20	75	80	60 - 140	94
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.4	10	70 - 130	104
		Bromofluorobenzene (Surrogate)	mg/kg	-	7.3	10	70 - 130	73
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	60	62.5	60 - 140	95

Volatile Petroleum Hydrocarbons in Water — Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB210036.002		TRH C6-C10	µg/L	50	850	946.63	60 - 140	90
		TRH C6-C9	µg/L	40	740	818.71	60 - 140	90
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	8.0	10	60 - 140	80
		d8-toluene (Surrogate)	µg/L	-	8.0	10	70 - 130	80
		Bromofluorobenzene (Surrogate)	µg/L	-	10.0	10	70 - 130	100
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	560	639.67	60 - 140	87

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE211528.001	LB209963.004	Lead, Pb	mg/kg	1	51	5	50	94

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE211454.007	LB209926.004	Lead, Pb	µg/L	1	21	<1	20	99

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE211528.003	LB209938.021		TRH C10-C14	mg/kg	20	41	<20	40	103
			TRH C15-C28	mg/kg	45	35	<45	40	88
			TRH C29-C36	mg/kg	45	33	<45	40	83
			TRH C37-C40	mg/kg	100	0	<100	-	-
			TRH C10-C36 Total	mg/kg	110	41	<110	-	-
			TRH >C10-C40 Total (F bands)	mg/kg	210	41	<210	-	-
		TRH F	TRH >C10-C16	mg/kg	25	41	<25	40	103
		Bands	TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	41	<25	-	-
			TRH >C16-C34 (F3)	mg/kg	90	33	<90	40	83
			TRH >C34-C40 (F4)	mg/kg	120	17	<120	-	-

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE211528.001	LB209931.004	Monocyclic	Benzene	mg/kg	0.1	3.2	<0.1	5	63
		Aromatic	Toluene	mg/kg	0.1	3.3	<0.1	5	66
			Ethylbenzene	mg/kg	0.1	3.5	<0.1	5	70
			m/p-xylene	mg/kg	0.2	7.2	<0.2	10	71
			o-xylene	mg/kg	0.1	3.7	<0.1	5	73
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.3	9.5	10	103
			d8-toluene (Surrogate)	mg/kg	-	10.4	9.8	10	104
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.5	7.4	10	75
		Totals	Total Xylenes	mg/kg	0.3	11	<0.3	-	-
			Total BTEX	mg/kg	0.6	21	<0.6	-	-

VOCs in Water

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE211461.014	LB210036.026	Monocyclic	Benzene	µg/L	0.5	48	<0.5	45.45	106
		Aromatic	Toluene	µg/L	0.5	48	<0.5	45.45	106
			Ethylbenzene	µg/L	0.5	49	<0.5	45.45	107
			m/p-xylene	µg/L	1	98	<1	90.9	107
			o-xylene	µg/L	0.5	48	<0.5	45.45	105
		Polycyclic	Naphthalene	µg/L	0.5	41	<0.5	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.2	7.2	-	102
			d8-toluene (Surrogate)	µg/L	-	10.0	6.5	-	100
			Bromofluorobenzene (Surrogate)	µg/L	-	10.2	10.1	-	102

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE211528.001	LB209931.004		TRH C6-C10	mg/kg	25	71	<25	92.5	76
			TRH C6-C9	mg/kg	20	64	<20	80	79
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.3	9.5	10	103
			d8-toluene (Surrogate)	mg/kg	-	10.4	9.8	10	104
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.5	7.4	-	75
		VPH F	Benzene (F0)	mg/kg	0.1	3.2	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	50	<25	62.5	79

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number	Parameter	Units	LOR

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Volatile Petroleum Hydrocarbons in Water (continued) — **Method: ME-(AU)-[ENV]AN433**

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE211461.014	LB210036.026		TRH C6-C10	µg/L	50	910	<50	946.63	96
			TRH C6-C9	µg/L	40	790	<40	818.71	97
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.2	7.2	-	102
			d8-toluene (Surrogate)	µg/L	-	10.0	6.5	-	100
			Bromofluorobenzene (Surrogate)	µg/L	-	10.2	10.1	-	102
		VPH F	Benzene (F0)	µg/L	0.5		<0.5	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	620	<50	639.67	96

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: https://www.sgs.com.au/~/media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022 QA QC Plan.pdf

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
***	Indicates that both * and ** apply.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.
①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to relevant report comments for further information.

Appendix J – Proposed Development Plan

DA DRAWING REGISTER

DRAWING NO.	DRAWING NAME
A 0000	TITLE PAGE
A 1000	SITE ANALYSIS
A 1010	SITE PLAN
A 1020	OPPORTUNITIES AND CONSTRAINTS
A 1030	UNIT SCHEDULE
A 1100	SURVEY PLAN
A 1101	DEMOLITION PLAN
A 1150	STREETSCAPE ANALYSIS
A 1201	BASEMENT 02 PLAN
A 1202	BASEMENT 01 PLAN
A 1203	GROUND FLOOR PLAN
A 1204	LEVEL 01 PLAN
A 1205	LEVEL 02 PLAN
A 1206	LEVEL 03 PLAN
A 1207	LEVEL 04 PLAN
A 1208	LEVEL 05 PLAN
A 1209	LEVEL 06 PLAN
A 1210	ROOF PLAN
A 1250	TYPICAL GOLD LIVABLE UNITS
A 1251	TYPICAL GOLD LIVABLE UNITS
A 1252	TYPICAL SILVER LIVABLE UNITS
A 1253	TYPICAL SILVER LIVABLE LAYOUTS
A 1301	NORTH ELEVATION
A 1302	EAST ELEVATION
A 1303	SOUTH ELEVATION
A 1304	WEST ELEVATION
A 1401	SECTION AA
A 1402	SECTION BB
A 1403	RAMP SECTION
A 2001	GFA CALCULATION
A 2002	AFFORDABLE UNITS CALCULATION
A 2010	SOLAR ACCESS DIAGRAM 2D
A 2011	SOLAR ACCESS DIAGRAM 3D
A 2020	CROSS-VENTILATION DIAGRAM 2D
A 2030	LANDSCAPE CALCULATION
A 2040	STORAGE SCHEDULE
A 2050	PERSPECTIVES
A 2101	SHADOW DIAGRAM 9.00 AM 21 JUNE
A 2102	SHADOW DIAGRAM 12.00 PM 21 JUNE
A 2103	SHADOW DIAGRAM 3.00 PM 21 JUNE
A 2201	MATERIAL SCHEDULE 1/2
A 2202	MATERIAL SCHEDULE 2/2

UNIT CALCULATIONS

GROUND FLOOR:	
RETAIL	04
2 BED	03
3 BED	01
TOTAL	08
LEVEL 01:	
1 BED	02
2 BED	05
3 BED	01
TOTAL	08
LEVEL 02:	
1 BED	03
2 BED	07
TOTAL	10
LEVEL 03:	
1 BED	01
2 BED	08
3 BED	01
TOTAL	10
LEVEL 04:	
1 BED	01
2 BED	08
3 BED	01
TOTAL	10
LEVEL 05:	
1 BED	01
2 BED	08
3 BED	01
TOTAL	10
LEVEL 06:	
1 BED	01
2 BED	08
3 BED	01
TOTAL	10

TOTAL 1 BED: 09
TOTAL 2 BED: 47
TOTAL 3 BED: 06

TOTAL RESIDENTIAL UNITS: 62
TOTAL RETAIL: 04
TOTAL YIELD: 66

GFA CALCULATIONS

SITE AREA = 1,782m^2
PERMISSIBLE FSR = 2.5:1 + 0.75 = 3.25:1 (30%) ARH BONUS
PERMISSIBLE GFA = 5,791.50m^2

TOTAL GFA: 5,763.77 m² SQM
TOTAL FSR: 3.23:1 (INC. 0.75 (30%) ARH BONUS)

CARPARKING

NON-AFFORDABLE UNITS:
TOTAL UNITS: 50
REQUIRED: 49
PROVIDED: 49

AFFORDABLE HOUSING:
1 BED UNITS: 1
2 BED UNITS: 11
REQUIRED: **6**
PROVIDED: **6**

RETAIL:
TOTAL UNITS: 4
REQUIRED: **7**
PROVIDED: **6 + 1 AMBULANT**

VISITOR
REQUIRED: 12
PROVIDED: **12**

TOTAL CARPARKING REQUIRED: **74**
TOTAL CARPARKING PROVIDED: **74**

GHAZI AL ALI ARCHITECT PTY LTD
21 / 47-55 John St, Leichhardt NSW 2040
T. +612 9744 7035 E.office@ghazia.com
NSW reg. no. **7542** ABN: 67167131848
Design Practitioner No. **DEP0000073**

PROPOSED MIXED USE DEVELOPMENT

WATERLOO RD

190 WATERLOO ROAD, GREENACRE

A1

DETAIL PLAN

0 5 10
METRES
SCALE 1 : 100

M.G.A. T.N.

ABT 1

LOT 22
DP 624967

2 STOREY
BRICK BUILDIING
FLAT ROOF

CUT 57.96

PARAPET 58.70
PARAPET 58.71
PARAPET 59.11
PARAPET 59.12
PARAPET 59.54
PARAPET 59.54

W
S 55.56
H 56.99

278°30'10"
16.21

276°50'10"
22.15

AWNING

ROAD

WATERLOO

EASEMENT FOR SEWERAGE PURPOSES OVER EXISTING LINE OF PIPES (DP 624967)

UNKNOWN VENT

MONITORING WELL

GRATE

PIT

SHED

PARAPET 55.29
PARAPET 55.06
PARAPET 55.78
PARAPET 55.03
PARAPET 55.76
PARAPET 55.73
PARAPET 55.05
PARAPET 53.85

CONCRETE

SINGLE STOREY
BRICK STORE
FLAT ROOF
No. 190
"WESTSIDE" SERVICE STATION

IL 50.34 GRATE IL 50.30 IL 50.27

PAVED

GARDEN

AWNING OVER
FUEL BOWSERS

6°45'10"
37.21

SIGN

WM

SVO

UNITEL

PIT
SL 50.06
IL 49.41

PIT
SL 50.08
IL 49.08

2 STOREY
BRICK BUILDIING
FLAT ROOF

188°30'10"
50.08

LOT 21
DP 624967
AREA 1782m²

CONCRETE

LOT 5
DP 659044

PARAPET 55.77

BM CUT IN KB
RL 50.305

5.785
44°28'45"

11.585
82°12'30"

14.085
83°44'10"

11.52
88°27'10"

WALL

LOW

POST

CONCRETE

GARDEN

HYD SV

TSB

PP
50.32

PP
50.30

PP
49.84

PIT
SL 49.85

TEL

BOL

GM

JUNO

PDE

TRAFFIC ISLAND

CL 50.46

CL 50.38

CL 50.40

LEGEND

BM	BENCHMARK
BOL	BOLLARD
CL	CENTRELINE OF ROAD
FL	FLOOR LEVEL
GM	GAS BOXES
H	HEAD OF WINDOW/DOOR
HYD	HYDRANT
IK	INVERT OF KERB
IL	INVERT LEVEL
LP	LIGHT POLE
PP	POWER POLE
S	SILL OF WINDOW/DOOR
SL	SURFACE LEVEL
SV	STOP VALVE
TEL	TELSTRA PIT
TK	TOP OF KERB
TL	TRAFFIC LIGHT
TSB	TRAFFIC SIGNAL BOX
W	WINDOW
WM	WATER METER

LAND IS BENEFITED BY AN EASEMENT FOR SEWERAGE PURPOSES OVER EXISTING LINE OF PIPES (DP 624967)

THIS DETAIL SURVEY IS NOT A 'SURVEY' AS DEFINED BY THE SURVEYORS ACT 1929. IF ANY CONSTRUCTION IS PLANNED IT WOULD BE ADVISABLE TO CARRY OUT FURTHER SURVEY WORK TO DETERMINE THE BOUNDARY DIMENSIONS.

ISSUE	AMENDMENTS	DATED
A	INITIAL ISSUE	28-6-17

CitiSurv Pty Ltd
ABN 32 122 758 276
CONSULTING SURVEYORS
P.O. BOX 439, KELLYVILLE NSW 2155
PHONE: (02) 9647 1142
E-mail: info@citisurv.com.au

SCALE 1:100	SHEET 1 OF 1	CLIENT ALPHA ENGINEERING	DATUM AHD ORIGIN OF LEVELS: SSM 141252 RL 47.68 DATED: 15-JUN-2017	PLAN DETAIL & LEVEL SURVEY SITE 190 WATERLOO ROAD GREENACRE	L.G.A. CANTERBURY-BANKSTOWN PARISH BANKSTOWN COUNTY CUMBERLAND	TITLE LOT 21 DP 624967	NOTES
DATE OF SURVEY 23-6-2017	PLOT FILE 10533-DET						
SURVEY FL	DRAWN JC						

NOTES
1. BOUNDARIES NOT SURVEYED.
2. AREAS & DIMENSIONS COMPILED FROM PLANS OBTAINED FROM THE LAND TITLES OFFICE.
3. TREE SYMBOLS ARE TO APPROXIMATE SCALE FOR TRUNK ⌀ AND CANOPY SPREAD
4. ALL OTHER SYMBOLS ARE NOT TO SCALE AND ARE DIAGRAMMATIC ONLY.
5. NO SERVICES SEARCH HAS BEEN UNDERTAKEN.
6. ONLY VISIBLE ABOVE GROUND SERVICES HAVE BEEN LOCATED.
7. ALL KERB LEVELS ARE ON THE TOP OF KERB UNLESS OTHERWISE STATED.
8. PLAN IS ACCURATE TO PLOT SCALE ONLY.
9. PLAN IS TO BE USED FOR DETAIL PURPOSES ONLY.
10. CONTOUR INTERVAL 0.5m

LEGEND

TO BE DEMOLISHED

PROPOSED DEVELOPMENT

SCALE 1:200 @ A3

0 1 2 5 10M

FOR DA PURPOSES ONLY

NOT FOR CONSTRUCTION

DA

A3 Drawing Original Size

Rev	Date	Description
A	28/02/2025	DA SUBMISSION

N

ACCESS — Vista Access Architects Pty. Ltd. www.accessarchitects.com.au PO Box 353, Kingswood NSW 2747 ABN: 82124411814

QUANTITY SURVEY — Duo Tax Quantity Surveyors Pty Ltd 344/11-21 Underwood Rd, Homebush NSW 2140 02 8999 1133

TRAFFIC — Suite 3, 53 Grandview Street, Pymble ABN 34 660 055 532 bernard@genesistraffic.com.au Bernard Lo

BASIX — UC Universal Consulting Engineers

ACOUSTIC — acouras consultancy www.acouras.com.au info@acouras.com.au

GEOTECHNICAL — Geotechnical Consultants Australia Pty Ltd (02) 9788 2829 info@geoconsultants.com.au www.geoconsultants.com.au

HYDRAULIC — Australiawide Consulting Services P/L

LANDSCAPING — enquiries@conzept.net.au www.conzept.net.au 02 9922 5312 conzept

BCA

CONTAMINATION — El Australia Pty Ltd Suite 6.01, 55 Miller Street, Pyrmont NSW 2009

PLANNING — think planners

WASTE MANAGEMENT — BARKER RYAN STEWART SYDNEY

ARCHITECT — GHAZI AL ALI ARCHITECT NSW reg. no. 7542
T. +612 9744 7035 | E. office@ghazia.com
ABN: 67167131848
21 / 47-55 JOHN ST, LEICHARDT NSW 2040

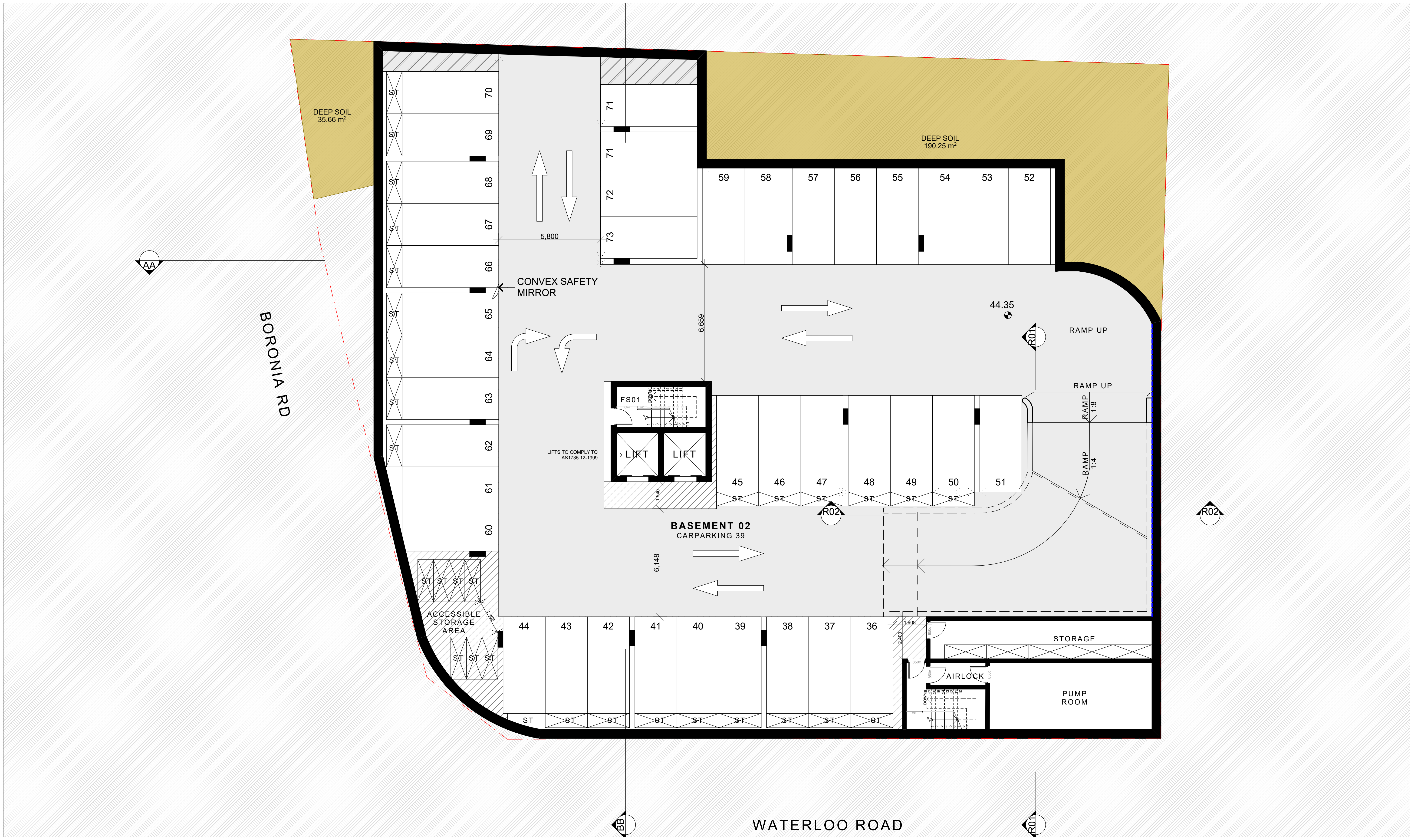
PROJECT		
190 WATERLOO RD, GREENACRE		
CLIENT: MOHAMMED DAHAR		
SCALE: 1:200	DATE: 28/02/2025	
DRAWN: SN, MO, FA, CJ	PROJECT ARCHITECT: MO	PROJECT DIRECTOR: GA

DRAWING NAME: DEMOLITION PLAN

PROJECT NUMBER: 29.17

DRAWING NUMBER: DA A 1101

ISSUE: A



BASEMENT 02
1:200

SCALE 1:200 @ A3

0 1 2 5 10M

FOR DA PURPOSES ONLY

NOT FOR CONSTRUCTION

DA

A3 Drawing Original Size

Rev	Date	Description
A	26/02/2025	DA SUBMISSION

N

ACCESS — QUANTITY SURVEY — TRAFFIC — BASIX — ACOUSTIC — GEOTECHNICAL — HYDRAULIC — LANDSCAPING — BCA — CONTAMINATION — PLANNING — WASTE MANAGEMENT

ARCHITECT
GHAZI AL ALI ARCHITECT
NSW reg. no. 7542
T. +612 9744 7035 | E. office@ghazia.com
21 / 47-55 JOHN ST, LEICHARDT NSW 2040

PROJECT: 190 WATERLOO RD, GREENACRE

CLIENT: MOHAMMED DAHAR

SCALE: 1:200 | DATE: 28/02/2025

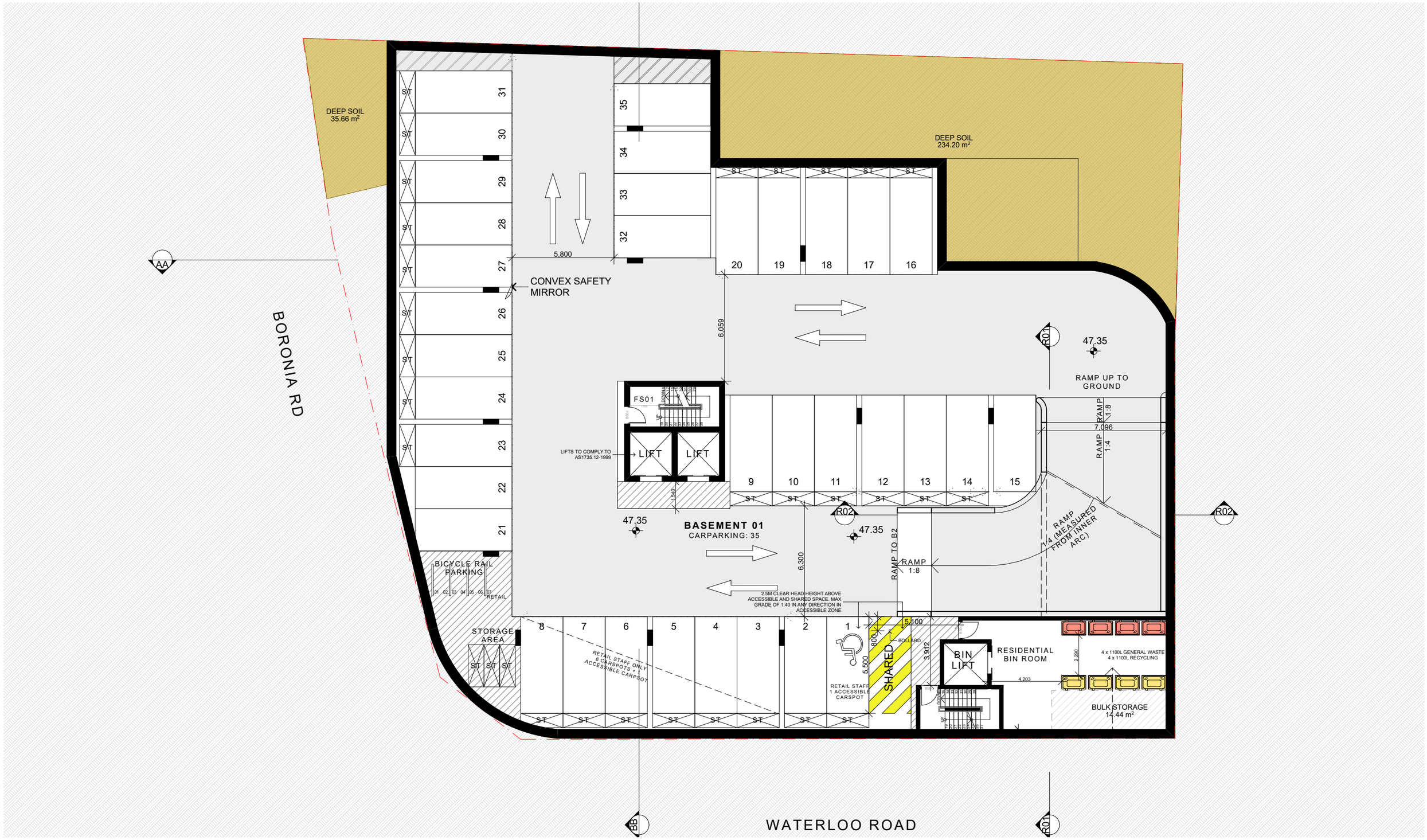
DRAWN: SN, MO, FA, CJ | PROJECT ARCHITECT: MO | PROJECT DIRECTOR: GA

DRAWING NAME: BASEMENT 02 PLAN

PROJECT NUMBER: 29.17

DRAWING NUMBER: DA A 1201

ISSUE: A



BASEMENT 01
1:200

SCALE 1:200 @ A3

0 1 2 5 10M

FOR DA PURPOSES ONLY

NOT FOR CONSTRUCTION

DA

A3 Drawing Original Size

Rev	Date	Description
A	28/02/2025	DA SUBMISSION

N

ACCESS
Vista Access Architects Pty. Ltd.
www.accessarchitects.com.au
admin@accessarchitects.com.au
PO Box 353, Kingswood NSW 2747
ABN: 82124411814

QUANTITY SURVEY
Duo Tax Quantity Surveyors Pty Ltd
34A/11-21 Underwood Rd, Homebush NSW 2140
02 8999 1133

TRAFFIC
Suite 3, 53 Grandview Street, Pymble
www.genesistraffic.com.au
ABN 34 660 055 532
bernard@genesistraffic.com.au
Bernard Lo

BASIX

ACOUSTIC
acouras CONSULTANCY
www.acouras.com.au
info@acouras.com.au

GEOTECHNICAL
Geotechnical Consultants Australia Pty Ltd
(02) 9786 2829
info@geoconsultants.com.au
www.geoconsultants.com.au

HYDRAULIC
Australiawide Consulting Services P/L

LANDSCAPING
enquiries@conzept.net.au
www.conzept.net.au
02 9922 5312

BCA

CONTAMINATION
El Australia Pty Ltd
Suite 6.01, 55 Miller Street,
Pyrmont NSW 2009

PLANNING
think planners

WASTE MANAGEMENT
BARKER RYDEN STEWART
SYDNEY

ARCHITECT
GHAZI AL ALI ARCHITECT
NSW reg. no. 7542
T. +612 9744 7035 | E. office@ghazia.com
ABN: 67167131848
21 / 47-55 JOHN ST,
LEICHARDT NSW 2040

PROJECT
190 WATERLOO RD, GREENACRE

CLIENT
MOHAMMED DAHAR

SCALE **1:200**

DATE **28/02/2025**

DRAWN **SN, MO, FA, CJ**

PROJECT ARCHITECT **MO**

PROJECT DIRECTOR **GA**

DRAWING NAME
BASEMENT 01 PLAN

PROJECT NUMBER **29.17**

DRAWING NUMBER **DA A 1202**

ISSUE **A**

LEGEND

- 3x3m DIMENSION
- 3.6x3.6m DIMENSION
- 4x4m DIMENSION

SCALE 1:200 @ A3

0 1 2 5 10M

GROUND FLOOR PLAN
1:200

FOR DA PURPOSES ONLY

NOT FOR CONSTRUCTION

DA

A3 Drawing Original Size

Rev	Date	Description
A	28/02/2025	DA SUBMISSION

ACCESS — Vista Access Architects Pty. Ltd.

TRAFFIC

ACOUSTIC — acouras consultancy

HYDRAULIC — Australiawide Consulting Services P/L

BCA

PLANNING — think planners

QUANTITY SURVEY

BASIX

GEOTECHNICAL — Geotechnical Consultants Australia Pty Ltd

LANDSCAPING — concept

CONTAMINATION — elaustralia

WASTE MANAGEMENT — BARKER RYAN STEWART

ARCHITECT

GHAZI AL ALI ARCHITECT PTY LTD

NSW reg. no. 7542

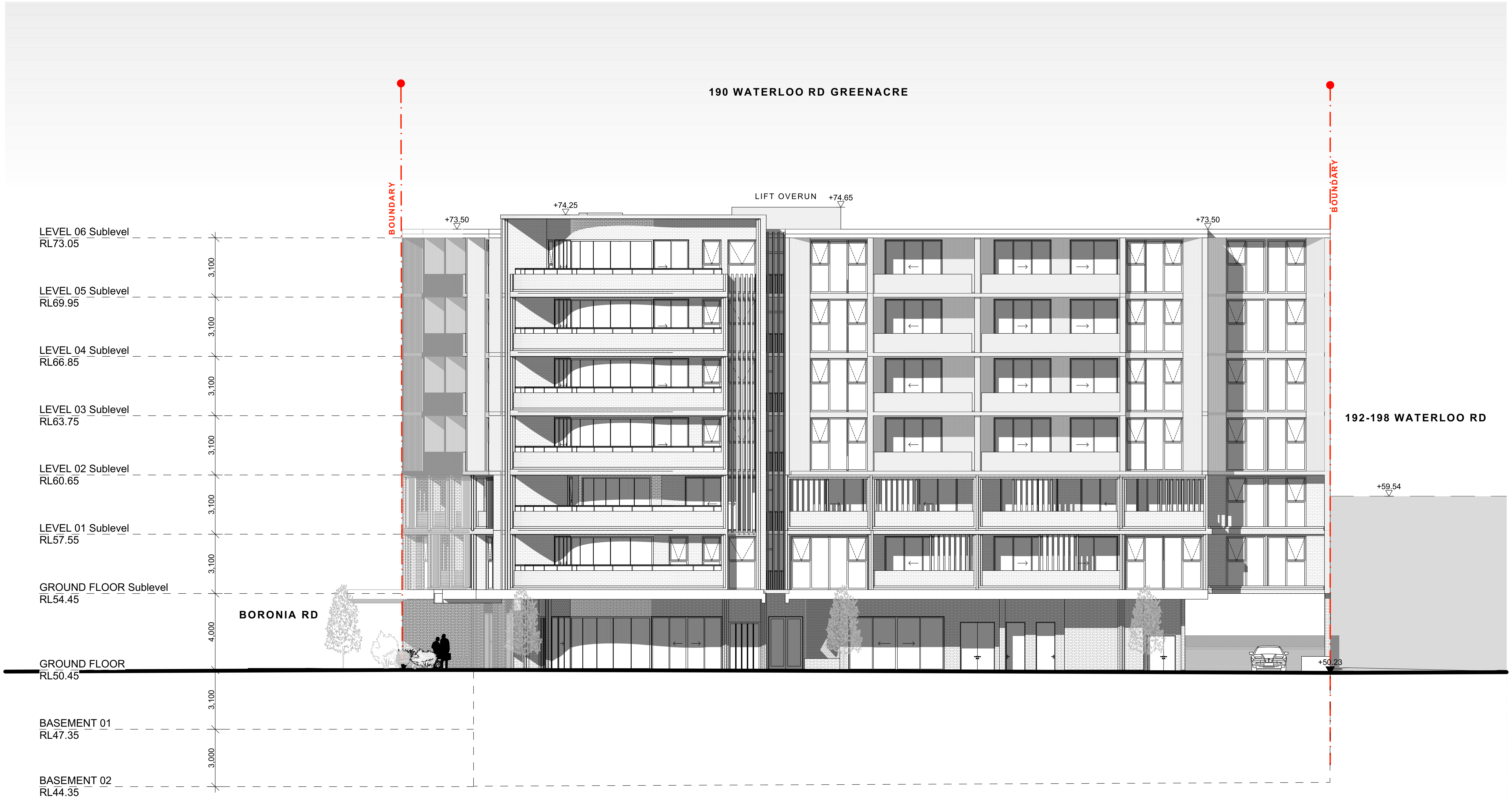
T. +612 9744 7035 | E. office@ghazia.com

ABN: 67167131848

21 / 47-55 JOHN ST, LEICHARDT NSW 2040

PROJECT	190 WATERLOO RD, GREENACRE	
CLIENT	MOHAMMED DAHAR	
SCALE	1:200, 1:100	DATE 28/02/2025
DRAWN SN, MO, FA, CJ	PROJECT ARCHITECT MO	PROJECT DIRECTOR GA

DRAWING NAME	PROJECT NUMBER	
GROUND FLOOR PLAN	29.17	
DRAWING NUMBER	DA A 1203	ISSUE A



EAST ELEVATION
1:200

SCALE 1:200 @ A3

0 1 2 5 10M

FOR DA PURPOSES ONLY

NOT FOR CONSTRUCTION

DA

A3 — Drawing Original Size

Rev	Date	Description
A	28/02/2025	DA SUBMSSION

N

ACCESS — Vista Access Architects Pty. Ltd., www.accessarchitects.com.au, admin@accessarchitects.com.au, PO Box 353, Kingswood NSW 2747, ABN: 82124411614

QUANTITY SURVEY — Duo Tax Quantity Surveyors Pty Ltd., 34A/11-21 Underwood Rd, Homebush NSW 2140, 02 8999 1133

TRAFFIC — Suite 3, 53 Grandview Street, Pymble, www.genesistraffic.com.au, ABN 34 660 055 532, bernard@genesistraffic.com.au, Bernard Lo

BASIX — UC Universal Consulting Engineers, a Suite 2B / 64 Kitchener Pde, Bankstown 2200 | m 0422 367 370 | e oudai.awad@uce.com.au | w www.uce.com.au |

ACOUSTIC — acouras consultancy, www.acouras.com.au, info@acouras.com.au

GEOTECHNICAL — Geotechnical Consultants Australia Pty Ltd, (02) 9788 2829, info@geoconsultants.com.au, www.geoconsultants.com.au

HYDRAULIC — Australiawide Consulting Services P/L, Civil & Structural Engineering and Project Management, 1369B Canterbury Rd, Punchbowl, NSW 2196, Mobile: 0420710548 Email: ertaz1@hotmail.com

LANDSCAPING — enquiries@conzept.net.au, www.conzept.net.au, 02 9922 5312, conzept Landscape Architects

BCA — DESIGN RIGHT CONSULTING PTY LTD, PARRAMATTA | PYRMONT, PO BOX 2331, NORTH PARRAMATTA 1750, 0405 295 978, ALEKS@DESIGNRC.COM.AU, WWW.DESIGNRC.COM.AU

CONTAMINATION — eiaustralia, EI Australia Pty Ltd, Suite 6.01, 55 Miller Street, Pyrmont NSW 2009

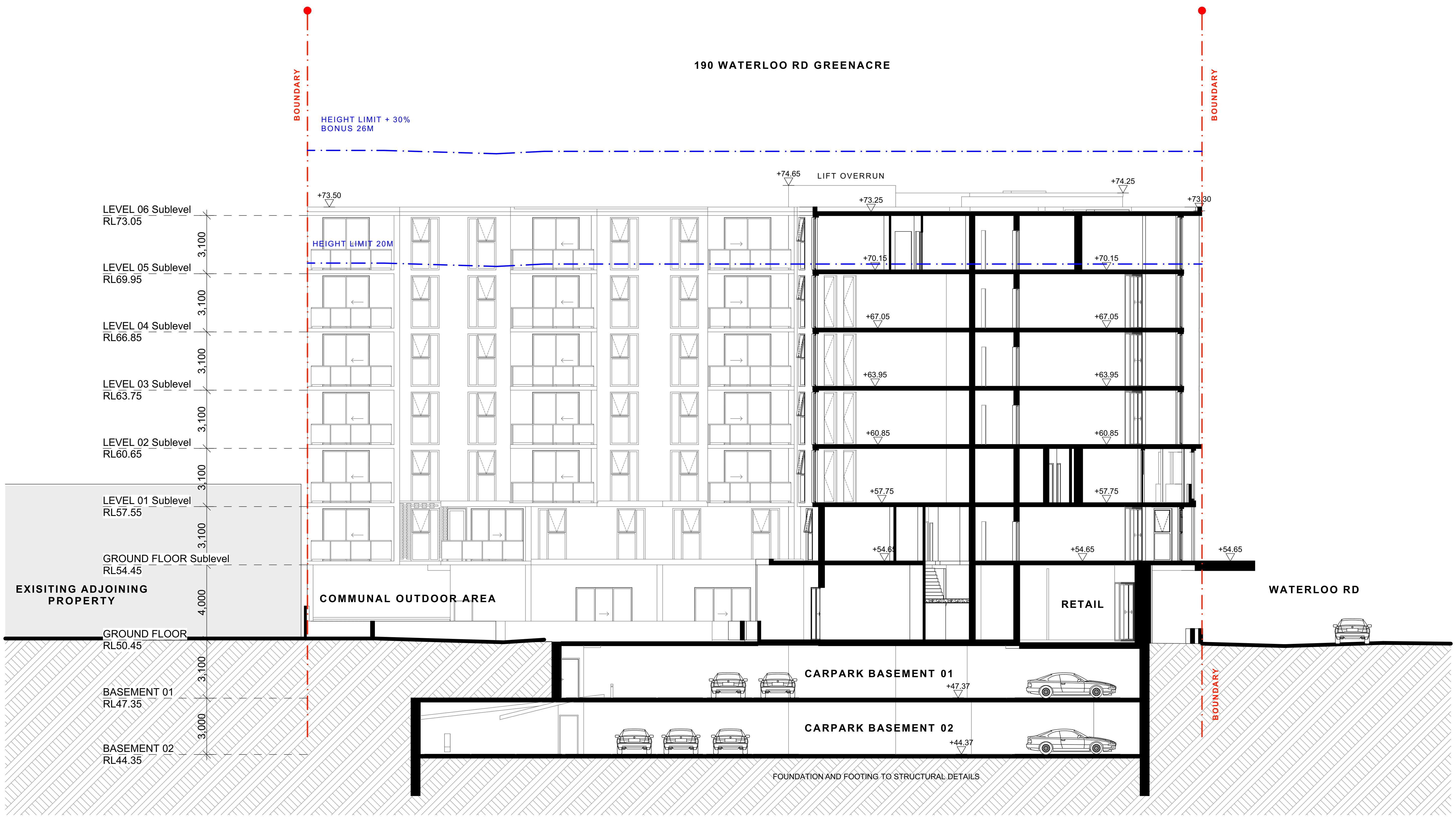
PLANNING — Adam Byrnes, Director, P: 0419 288 899, www.thinkplanners.com.au, think planners

WASTE MANAGEMENT — BARKER RYAN STEWART, SYDNEY, P (02) 9659 0005, E sydney@brs.com.au

ARCHITECT — GHAZI AL ALI ARCHITECT PTY LTD, NSW reg. no. 7542, T. +612 9744 7035 | E. office@ghazia.com, ABN: 67167131848, 21 / 47-55 JOHN ST, LEICHARDT NSW 2040

PROJECT	190 WATERLOO RD, GREENACRE	
CLIENT	MOHAMMED DAHAR	
SCALE: 1:200	DATE: 28/02/2025	
DRAWN: SN, MO, FA, CJ	PROJECT ARCHITECT: MO	PROJECT DIRECTOR: GA

DRAWING NAME	PROJECT NUMBER
EAST ELEVATION	29.17
DRAWING NUMBER: DA A 1302	ISSUE: A



SECTION A-A
1:200

SCALE 1:200 @ A3
0 1 2 5 10M

FOR DA PURPOSES ONLY
NOT FOR CONSTRUCTION
DA
A3 Drawing Original Size

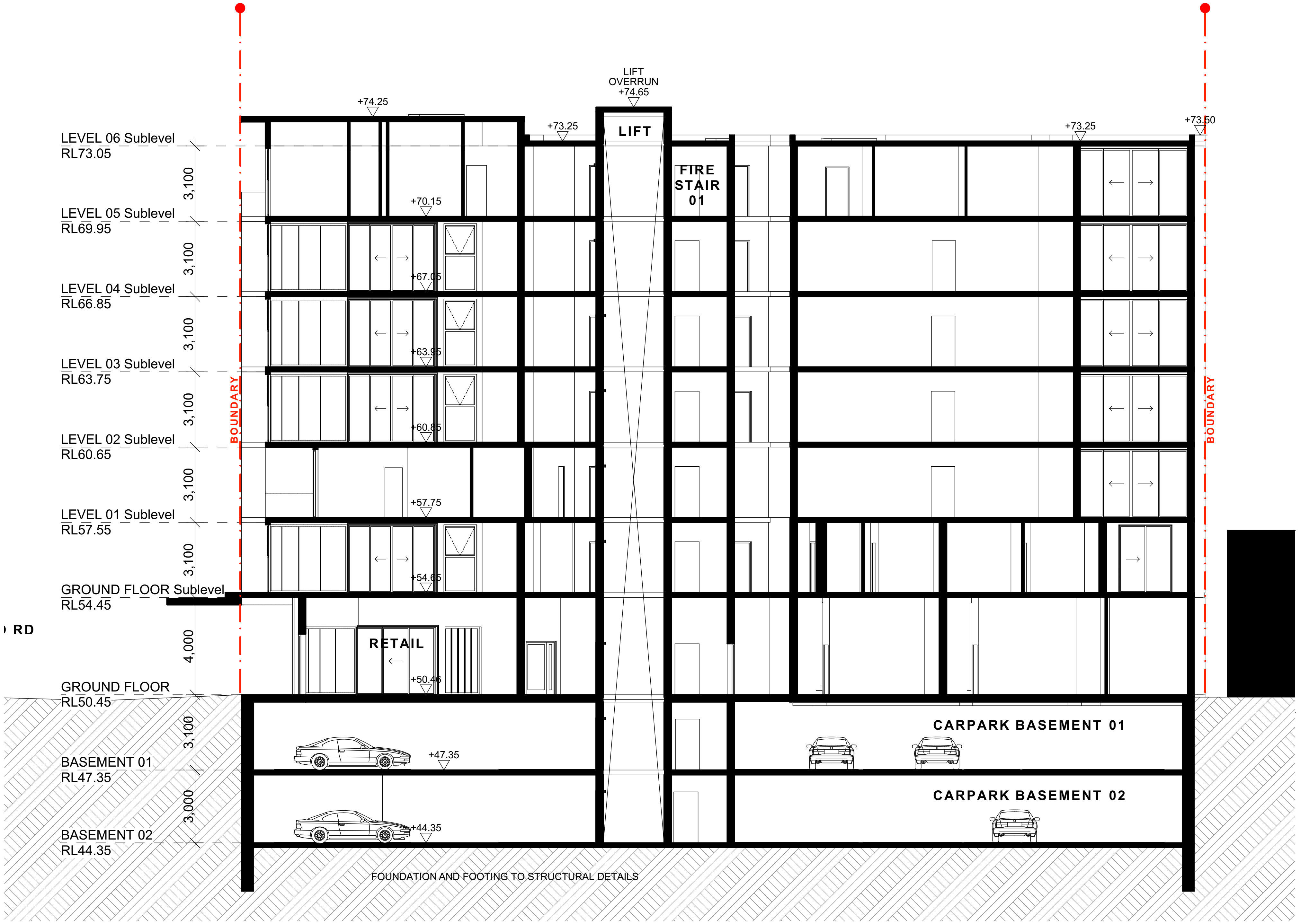
A | 28/02/2025 | DA SUBMISSION
Rev | Date | Description

ACCESS — Vista Access Architects Pty. Ltd.
QUANTITY SURVEY — Duo Tax Quantity Surveyors Pty Ltd
TRAFFIC
BASIX
ACOUSTIC — acouras consultancy
GEOTECHNICAL — Geotechnical Consultants Australia Pty Ltd
HYDRAULIC — Australiawide Consulting Services P/L
LANDSCAPING — conzept
BCA
CONTAMINATION — El Australia Pty Ltd
PLANNING — think planners
WASTE MANAGEMENT — BARKER RYAN STEWART

ARCHITECT
GHAZI AL ALI ARCHITECT PTY LTD
NSW reg. no. 7542
T. +612 9744 7035 | E. office@ghazia.com
ABN: 67167131848
21 / 47-55 JOHN ST,
LEICHARDT NSW 2040

PROJECT: 190 WATERLOO RD, GREENACRE		
CLIENT: MOHAMMED DAHAR		
SCALE: 1:200	DATE: 28/02/2025	
DRAWN: SN, MO, FA, CJ	PROJECT ARCHITECT: MO	PROJECT DIRECTOR: GA

DRAWING NAME: SECTION AA	PROJECT NUMBER: 29.17
DRAWING NUMBER: DA A 1401	ISSUE: A



SECTION B-B
1:200

SCALE 1:200 @ A3

0 1 2 5 10M

FOR DA PURPOSES ONLY

NOT FOR CONSTRUCTION

DA

A3

Drawing Original Size

Rev	Date	Description
A	28/02/2025	DA SUBMSSION

N

ACCESS
Vista Access Architects Pty. Ltd.
www.accessarchitects.com.au
admin@accessarchitects.com.au
PO Box 353, Kingswood NSW 2747
ABN: 82124411614

QUANTITY SURVEY
Duo Tax Quantity Surveyors Pty Ltd.
34A/11-21 Underwood Rd, Homebush NSW 2140
02 8999 1133

TRAFFIC
Suite 3, 53 Grandview Street, Pymble
www.genesistraffic.com.au
ABN 34 660 055 532
bernard@genesistraffic.com.au
Bernard Lo

BASIX
UNIVERSAL CONSULTING ENGINEERS
a Suite 2B / 64 Kitchener Pde, Bankstown 2200 | m 0422 367 370 | e oudai.awad@uce.com.au | w www.uce.com.au |

ACOUSTIC
acouras CONSULTANCY
www.acouras.com.au
info@acouras.com.au

GEOTECHNICAL
Geotechnical Consultants Australia Pty Ltd
(02) 9788 2829
info@geoconsultants.com.au
www.geoconsultants.com.au

HYDRAULIC
Australiawide Consulting Services P/L
Civil & Structural Engineering and Project Management
1369B Canterbury Rd, Punchbowl, NSW 2196
Mobile: 0420710548 Email: ertaz1@hotmail.com

LANDSCAPING
enquiries@conzept.net.au
www.conzept.net.au
02 9922 5312
conzept Landscape Architects

BCA
DESIGN RIGHT CONSULTING PTY LTD
PARRAMATTA | PYRMONT
PO BOX 2331, NORTH PARRAMATTA 1750
0405 295 978
ALEKS@DESIGNRC.COM.AU
WWW.DESIGNRC.COM.AU

CONTAMINATION
eiaustralia
EI Australia Pty Ltd
Suite 6.01, 55 Miller Street,
Pyrmont NSW 2009

PLANNING
Adam Byrnes
Director
P: 0419 288 899
www.thinkplanners.com.au
think planners

WASTE MANAGEMENT
BARKER RYAN STEWART
SYDNEY
P (02) 9659 0005
E sydney@brs.com.au

ARCHITECT
GHAZI AL ALI ARCHITECT PTY LTD
NSW reg. no. 7542
T. +612 9744 7035 | E. office@ghazia.com
ABN: 67167131848
21 / 47-55 JOHN ST,
LEICHARDT NSW 2040

PROJECT
190 WATERLOO RD, GREENACRE

CLIENT
MOHAMMED DAHAR

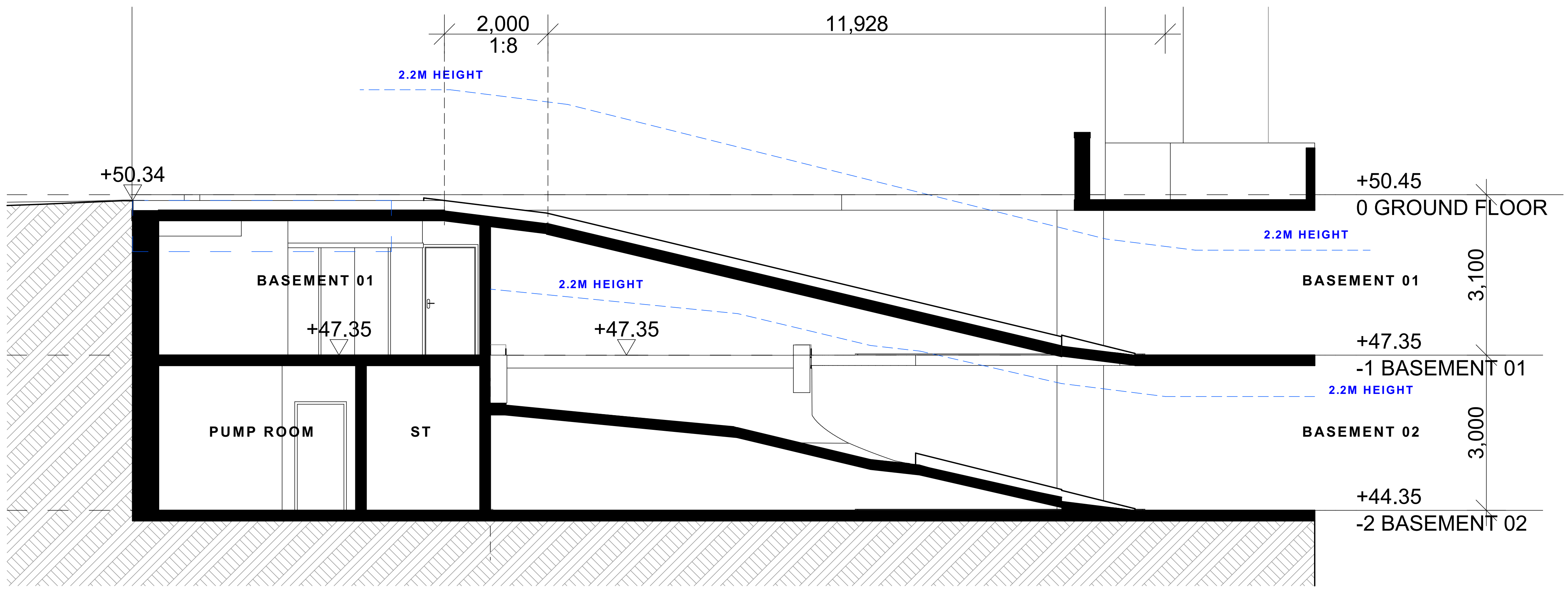
SCALE	DATE	
1:200	28/02/2025	
DRAWN	PROJECT ARCHITECT	PROJECT DIRECTOR
SN, MO, FA, CJ	MO	GA

DRAWING NAME
SECTION BB

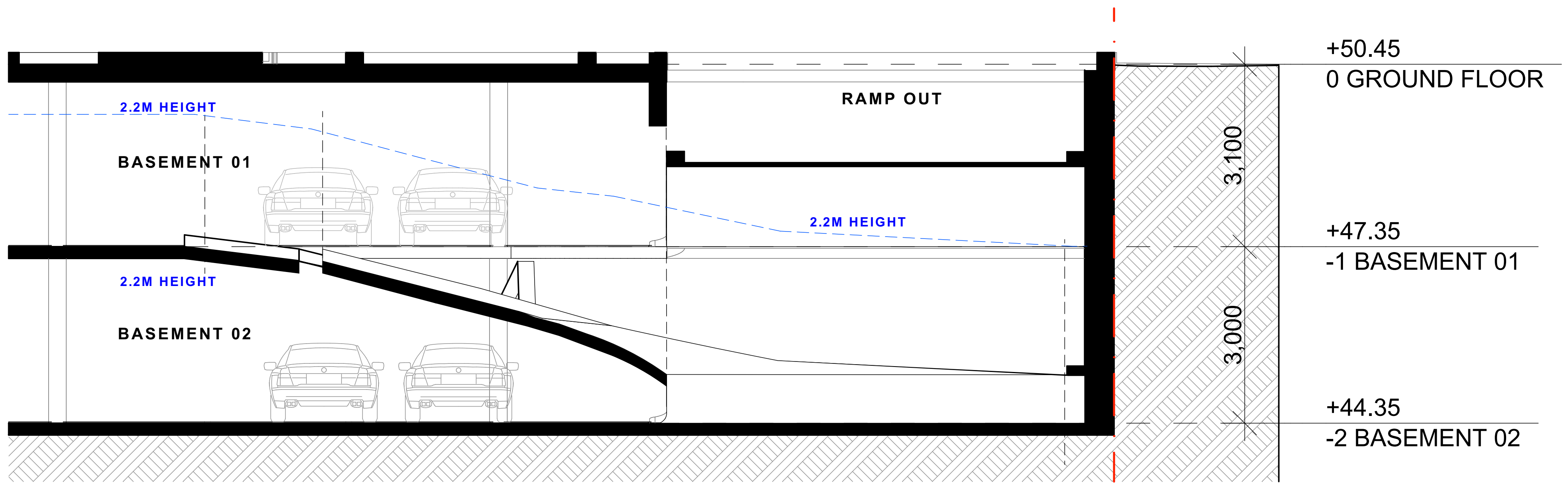
PROJECT NUMBER
29.17

DRAWING NUMBER
DA A 1402

ISSUE
A



RAMP SECTION R01
1:100



RAMP SECTION R02
1:100

FOR DA PURPOSES ONLY
NOT FOR CONSTRUCTION
DA

A3 Drawing Original Size

Rev	Date	Description
A	26/02/2025	DA SUBMISSION

N

ACCESS · QUANTITY SURVEY · TRAFFIC · BASIX · ACOUSTIC · GEOTECHNICAL · HYDRAULIC · LANDSCAPING · BCA · CONTAMINATION · PLANNING · WASTE MANAGEMENT

ARCHITECT
GHAZI AL ALI ARCHITECT PTY LTD
NSW reg. no. 7542
T. +612 9744 7035 | E. office@ghazia.com
ABN: 67167131848
21 / 47-55 JOHN ST,
LEICHARDT NSW 2040

PROJECT		
190 WATERLOO RD, GREENACRE		
CLIENT: MOHAMMED DAHAR		
SCALE: 1:100	DATE: 28/02/2025	
DRAWN: SN, MO, FA, CJ	PROJECT ARCHITECT: MO	PROJECT DIRECTOR: GA

DRAWING NAME	PROJECT NUMBER
RAMP SECTION	29.17
DRAWING NUMBER: DA A 1403	ISSUE: A