REPORT TO

CAMPBELLTOWN CATHOLIC CLUB

C/- SCOTT CARVER

ON

REMEDIATION ACTION PLAN

FOR

PROPOSED CAMPBELLTOWN CATHOLIC CLUB INDEPENDENT LIVING DEVELOPMENT

AT

3 OLD MENANGLE ROAD, CAMPBELLTOWN, NSW

Date: 3 September 2024

Ref: E36287BLrpt4-RAP DRAFT

JKEnvironments

www.jkenvironments.com.au

T: +61 2 9888 5000

JK Environments Pty Ltd

ABN 90 633 911 403

Report prepared by:

Harry Leonard
Associate | Environmental Scientist

Report reviewed by:

Vittal Boggaram
Principal Associate | Environmental Engineer

For and on behalf of
JKE
PO BOX 976
NORTH RYDE BC NSW 1670

DOCUMENT REVISION RECORD

Report Reference	Report Status	Report Date
E36287BLrpt4-RAP DRAFT	Draft Report	3 September 2024

Executive Summary

Campbelltown Catholic Club ('the client') commissioned JK Environments (JKE) to prepare a Remediation Action Plan (RAP) for the proposed Campbelltown Catholic Club Independent Living development at 3 Old Menangle Road, Campbelltown, NSW ('the site'). The site location is shown on Figure 1 and the RAP applies to the land within the site boundaries as shown on Figure 2 in Appendix A.

This report has been prepared to support the lodgement of a Development Application (DA) for the proposed residential development, with regards to Chapter 4 (Clause 4.6) of State Environmental Planning Policy (Resilience and Hazards) 2021[1] (formerly known as SEPP55).

JKE has previously undertaken a Preliminary Site Investigation (PSI)[2] and a Detailed Site Investigation (DSI)[3] at the site. A summary of this information has been included in Section 2. The investigations identified asbestos contamination in and on fill soil at the site that triggered a need for remediation.

From the supplied architectural drawings (Ref. 20220099, Drawing No. AD-DA097 to AD-DA103 & AD-DA107, all Revision C) prepared by Scott Carver, we understand the proposed development will include construction of an eight-storey building over three basement levels. Due to the sloping nature of the site (i.e. down to the north-east), excavation will be required to depths of approximately 9.3m below ground level (BGL) at the north-eastern end, and 12mBGL at the south-western end with potentially localised deeper excavations of up to 2m depth, required for any lift-over run pits.

Two ramps will be constructed in the western corner of the proposed basement to provide access to the neighbouring two-level basement to the north-west. An Onsite Detention (OSD) tank will also be installed immediately behind the north-eastern basement wall. On-grade roadways, footpaths, outdoor spaces and landscaped garden areas will surround the proposed building. The existing single storey building (i.e. 'Emily Cottage') located in the eastern corner of the site will be retained.

The goal of the remediation is to render the site suitable for the proposed development from a contamination viewpoint. The primary aim of the remediation at the site is to reduce the human health and ecological risks posed by site contamination to an acceptable level. The objectives of the RAP are to:

- Provide a rationale to support the extent of the proposed remediation and the remedial/site validation approach;
- Document a methodology that is to be implemented to remediate and validate the site;
- Provide a contingency plan for the remediation works;
- Outline site management procedures to be implemented during remediation work; and
- Provide an unexpected finds protocol to be implemented during the development works in the case of unexpected contamination related finds.

Investigations at the site by JKE has identified asbestos in and on fill that represents a potential risk to human receptors during site development/excavation works and future site use.

The proposed remediation strategy includes excavation and off-site disposal of the contaminated fill from with the proposed basement and ground floor footprints to a licensed landfill facility, and surficial removal of ACM/FCF across the ground surface of the remainder of the site, and on-going management. The anticipated sequence of remediation works is outlined in Section 6.3 of this RAP. Remediation will be deemed complete following the successful removal of contaminated fill and validation of this process. It is noted that capping will occur concurrently with the construction of the built form of the development and the project team must consult with the consent authority so that this is appropriately considered in the development consent conditions.

[1] *State Environmental Planning Policy (Resilience and Hazards) 2021* (NSW) (referred to as SEPP Resilience and Hazards 2021)

[2] JKE, (2023). *Report to Campbelltown Catholic Club on Preliminary Site Investigation for Proposed Campbelltown Catholic Club Independent Living at 3 Old Menangle Road, Campbelltown, NSW.* (referred to as PSI report)

[3] JKE, (2024). *Report to Campbelltown Catholic Club on Detailed Site Investigation for Proposed Campbelltown Catholic Club Independent Living at 3 Old Menangle Road, Campbelltown, NSW.* (referred to as DSI report)

JKE is of the opinion that the risk posed by contamination at the site can be managed during construction and reduced to an acceptable level for the proposed development via remediation and the implementation of this RAP.

A site validation report is to be prepared on completion of remediation activities to demonstrate that the site is suitable for the proposed development from a contamination risk perspective. A LTEMP/AMP will be prepared as part of the validation process to manage the potential for asbestos contamination impacts on-site. JKE is of the opinion that the RAP has met the objectives outlined in Section 1.2 and we consider that the site will be rendered suitable for the proposed development subject to the appropriate implementation of the RAP.

We have assessed that the remediation falls within Category 1, as the land is mapped as being a heritage conservation area. This should be confirmed by the client's expert planner.

The conclusions and recommendations should be read in conjunction with the limitations presented in the body of this report.

Table of Contents

List of Tables

Attachments

Abbreviations

Asbestos Containing Material	ACM
Australian Height Datum	AHD
Below Ground Level	BGL
Benzo(a)pyrene Toxicity Equivalent Factor	BaP TEQ
Benzene, Toluene, Ethylbenzene, Xylene	BTEX
Contaminated Land Management	CLM
Contaminant(s) of Potential Concern	CoPC
Conceptual Site Model	CSM
Development Application	DA
Data Quality Indicator	DQI
Data Quality Objective	DQO
Detailed Site Investigation	DSI
Ecological Investigation Level	EIL
Ecological Screening Level	ESL
Environmental Management Plan	EMP
Environment Protection Authority	EPA
Environment Protection Licence	EPL
Health Investigation Level	HIL
Health Screening Level	HSL
International Organisation of Standardisation	ISO
JK Environments	JKE
Lab Control Spike	LCS
Long-Term Environmental Management Plan	LTEMP
National Association of Testing Authorities	NATA
National Environmental Protection Measure	NEPM
Organochlorine Pesticides	OCP
Organophosphate Pesticides	OPP
Polycyclic Aromatic Hydrocarbons	PAH
Polychlorinated Biphenyls	PCB
Photo-ionisation Detector	PID
Protection of the Environment Operations	POEO
Practical Quantitation Limit	PQL
Quality Assurance	QA
Quality Control	QC
Remediation Action Plan	RAP
Site Assessment Criteria	SAC
Sampling, Analysis and Quality Plan	SAQP
Source, Pathway, Receptor	SPR
Total Recoverable Hydrocarbons	TRH
Trip Spike	TS
Validation Assessment Criteria	VAC
Virgin Excavated Natural Material	VENM
Work Health and Safety	WHS

Units	
Metres BGL	mBGL
Metres	m
Millilitres	ml or mL
Milligrams per Kilogram	mg/kg
Percentage	%
Percentage weight for weight	%w/w

1 INTRODUCTION

Campbelltown Catholic Club ('the client') commissioned JK Environments (JKE) to prepare a Remediation Action Plan (RAP) for the proposed Campbelltown Catholic Club Independent Living development at 3 Old Menangle Road, Campbelltown, NSW ('the site'). The site location is shown on Figure 1 and the RAP applies to the land within the site boundaries as shown on Figure 2 in Appendix A.

This report has been prepared to support the lodgement of a Development Application (DA) for the proposed residential development, with regards to Chapter 4 (Clause 4.6) of State Environmental Planning Policy (Resilience and Hazards) 2021[4] (formerly known as SEPP55).

JKE has previously undertaken a Preliminary Site Investigation (PSI)[5] and a Detailed Site Investigation (DSI)[6] at the site. A summary of this information has been included in Section 2. The investigations identified asbestos contamination in and on fill soil at the site that triggered a need for remediation.

1.1 Proposed Development Details

From the supplied architectural drawings (Ref. 20220099, Drawing No. AD-DA097 to AD-DA103 & AD-DA107, all Revision C) prepared by Scott Carver, we understand the proposed development will include construction of an eight-storey building over three basement levels. Due to the sloping nature of the site (i.e. down to the north-east), excavation will be required to depths of approximately 9.3m below ground level (BGL) at the north-eastern end, and 12mBGL at the south-western end with potentially localised deeper excavations of up to 2m depth, required for any lift-over run pits.

Two ramps will be constructed in the western corner of the proposed basement to provide access to the neighbouring two-level basement to the north-west. An Onsite Detention (OSD) tank will also be installed immediately behind the north-eastern basement wall. On-grade roadways, footpaths, outdoor spaces and landscaped garden areas will surround the proposed building. The existing single storey building (i.e. 'Emily Cottage') located in the eastern corner of the site will be retained. Proposed development plans provided to JKE are included in the appendices.

1.2 Remediation Goal, Aims and Objectives

The goal of the remediation is to render the site suitable for the proposed development from a contamination viewpoint. The primary aim of the remediation at the site is to reduce the human health risks posed by site contamination to an acceptable level.

[4] *State Environmental Planning Policy (Resilience and Hazards) 2021* (NSW) (referred to as SEPP Resilience and Hazards 2021)

[5] JKE, (2023). *Report to Campbelltown Catholic Club on Preliminary Site Investigation for Proposed Campbelltown Catholic Club Independent Living at 3 Old Menangle Road, Campbelltown, NSW.* (referred to as PSI report)

[6] JKE, (2024). *Report to Campbelltown Catholic Club on Detailed Site Investigation for Proposed Campbelltown Catholic Club Independent Living at 3 Old Menangle Road, Campbelltown, NSW.* (referred to as DSI report)

The objectives of the RAP are to:

- Provide a rationale to support the extent of the proposed remediation and the remedial/site validation approach;
- Document a methodology that is to be implemented to remediate and validate the site;
- Provide a contingency plan for the remediation works;
- Outline site management procedures to be implemented during remediation work; and
- Provide an unexpected finds protocol to be implemented during the development works in the case of unexpected contamination related finds.

1.3 Scope of Work

The RAP was prepared generally in accordance with a JKE proposal (Ref: EP59795BLrev1) of 15 February 2024 and written acceptance from the client of 3 May 2024. The scope of work included a review of previous reports, review of the Conceptual Site Model (CSM), review of the proposed development details, consultation with the client and preparation of the RAP.

The scope of work was undertaken with reference to the National Environmental Protection (Assessment of Site Contamination) Measure 1999 as amended (2013)[7], Consultants Reporting on Contaminated Land (2020)[8] guidelines, other guidelines made under or with regards to the Contaminated Land Management Act (1997)[9]. A list of reference documents/guidelines is included in the appendices.

[7] National Environment Protection Council (NEPC), (2013). *National Environmental Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013).* (referred to as NEPM 2013)

[8] NSW EPA, (2020). *Consultants reporting on contaminated land, Contaminated Land Guidelines.* (referred to as Consultants Reporting Guidelines)

[9] Contaminated Land Management Act 1997 (NSW) (referred to as CLM Act 1997)

2 SITE INFORMATION

2.1 Summary of PSI

The client commissioned JKE to undertake a PSI at the site for the proposed independent living development in 2023. The purpose of the investigation was to make a preliminary assessment of site contamination.

The PSI included a review of historical information and sampling from two boreholes. Based on the scope of work undertaken for the PSI, JKE identified fill material; historical agricultural use; use of pesticides; and hazardous building material as potential contamination sources and/or areas of environmental concern (AEC).

Bonded asbestos in the form of Fibre Cement Fragments (FCF) was encountered at the surface in the western portion of the site (shown on Figures 2 and 3 of the PSI report). All other contaminants of potential concern (CoPC) concentrations in soil were below the adopted site assessment criteria (SAC).

Based on the potential contamination sources/AEC identified, and the potential for site contamination, the PSI recommended preparation of a DSI to further characterise site contamination conditions and establish whether the site needs to be remediated to render the site suitable for the proposed development. The PSI also recommended a hazardous building materials survey be undertaken prior to demolition of the buildings, and an asbestos clearance certificate be obtained following demolition.

2.2 Summary of DSI

The DSI included soil sampling from 13 sample locations and groundwater sampling from two groundwater wells (one well remained dry during the DSI). Bonded asbestos in the form of Asbestos Containing Material (ACM) was encountered during the DSI at the surface in the vicinity of Emily Cottage in the eastern portion of the site. Asbestos in the form of AF/FA (friable) was detected in fill soil at a concentration below the adopted human health-based SAC at one location (TP110) as shown on Figure 3.

All remaining soil samples submitted for analysis reported low soil contaminant concentrations, below the adopted SAC.

Zinc was encountered in groundwater above the ecological SAC. The ecological risks associated with minor detections of zinc in groundwater were assessed to be low.

The DSI concluded that potential risks from exposure to asbestos were identified. On this basis, and with due consideration to the data gaps, the DSI recommended preparation of a RAP and Asbestos Management Plan (AMP) for the proposed development. Site remediation and validation will be required in accordance with the RAP.

The DSI also recommended implementing some interim management measures in the areas where there is exposed soil at the surface to mitigate the immediate risks to site users posed by the asbestos contamination identified at the site. This included the following:

- Undertake an 'emu pick' of the area around Emily Cottage and the residential property at the site for fragments of FCF/suspected ACM at the surface of the site. The pick should be conducted by a suitably licensed asbestos contractor. On completion of the pick, a clearance certificate should be issued by a competent person or NSW Licensed Asbestos Assessor to ensure the area is free of visible asbestos;
- Ensure garden beds or areas of exposed soil are suitably covered with mulch are grass cover;
- Restrict gardening/maintenance activities in the area around Emily Cottage and the residential property until such time as the soil can be remediated and/or the risk of exposure can be eliminated; and
- An AMP for the site should be prepared and implemented. The AMP will provide guidance on management of known asbestos at the site.

2.3 Site Identification

Table 2-1: Site Identification

Site Owner:	Campbelltown Catholic Club Limited
Site Address:	3 Old Menangle Road, Campbelltown, NSW
Lot & Deposited Plan:	Part of Lot 10 in DP1134526 Lots 3 and 4 in DP193040 Lot 61 in DP997095
Current Land Use:	Residential and commercial
Proposed Land Use:	Residential (Independent Aged Care)
Local Government Authority:	Campbelltown City Council
Current Zoning:	MU1: Mixed Use
RL (AHD in m) (approx.):	70-73
Site Area (m^2 approximately):	4,500m^2
Geographical Location in decimal degrees (centre point approx.):	Latitude: -34.073776 Longitude: 150.807578
Site Location Plan	Figure 1
Sample Remediation Plan:	Figure 2

2.4 Site Description and Summary of Site Inspection

The site is located in a predominantly commercial and residential area of Campbelltown and is bound by Camden Road along the north to north-eastern boundary, and Old Menangle Road along the southern boundary. The site is located approximately 75m to the west of Fishers Ghost Creek which is a tributary to the larger Bow Bowing Creek.

The regional topography is characterised by a north facing hillside that falls towards Bow Bowing Creek. The site is located near the toe of the hillside and slopes down towards the north and north-east at a gradient of approximately 2-3°. Parts of the site appear to have been levelled to account for the slope and accommodate the existing development.

A walkover inspection of the site was undertaken by JKE for the PSI on 19 October 2023 and subsequently for the DSI on 20 May 2024. The site conditions remained generally similar to the observations made during the JKE inspection undertaken for the PSI, with key observations summarised below:

- The south-west portion of the site was occupied by a residential property (lots 3 & 4 in DP193040) with a single storey house and surrounding grassed lawns. The central and north-east portions of the site (part of Lot 10 in DP1134526) was used for the storage of shipping containers in the south and also made up a small area of the adjoining Catholic Club car par in the north, which was partially paved with concrete and asphaltic concrete (AC) at the surface. The south-eastern corner of the site was occupied by the heritage site 'Emily House' (Lot 61 in DP997035) which consisted of the heritage cottage surrounded by grassed and vegetated lawns;
- All on site buildings appeared in good condition and were mostly of brick, sandstone and timber construction. Potential asbestos containing fibre cement lining was identified to the external eave and awning linings of the residential building in the south-west corner. The roof tiles of the original portion of Emily House were also noted as potentially containing asbestos;
- No waste or chemicals were noted to be stored on site at the time of the inspection;
- The site overall appears to have been cut and/or filled to compensate for the overall slope of the site and create a level surface for the existing developments;
- Several FCF were identified at the ground surface within the vicinity of the heritage cottage. The fragments were presumed to be associated with the building's roof tiles. A representative sample (FCF101) was collected for asbestos analysis as part of the DSI;
- Surface water was presumed to flow in sympathy with the overall gradient of the site towards the north and north-east. Drainage pits were noted in the surrounding car park to the west and north that were connected to the local stormwater system;
- Sensitive environments such as wetlands, ponds, creeks or extensive areas of natural vegetation were not identified on site or in the immediate surrounds; and
- Native and exotic shrubs and large trees were present across the site, in ground and within small landscaped areas. No signs of stress or dieback were identified.

2.5 Summary of Geology and Hydrogeology

Regional geological information was reviewed for the previous investigations and indicated that the site is underlain by Alluvium, which typically consists of unconsolidated alluvial clay, silt, sand and gravel deposits. The land immediately to the south of the site is underlain by Ashfield Shale of the Wianamatta Group, which typically consists of black to dark grey shale and laminite.

A summary of the subsurface conditions encountered during the previous investigations is presented in the following table:

Table 2-2: Summary of Subsurface Conditions

Profile	Description
Pavement	Asphaltic Concrete (AC)/Concrete/Brick pavement was encountered at the surface in BH101, BH102, BH103, BH104, BH105 and BH109 with a thickness of between 0.05mBGL and 0.16mBGL.
Fill	Fill was encountered at the surface or beneath the pavement in all locations and extended to depths of approximately 0.3mBGL to 1.1mBGL. TP113 was terminated in the fill at a maximum depth of approximately 1.1mBGL. The fill typically comprised silty clay, silty sand or clayey sandy gravel with inclusions of igneous gravel, sandstone gravel, ironstone gravel, ash, slag and building rubble (asphalt, bricks, concrete, glass, tile fragments). Odours or staining were not encountered in the fill during drilling.
Natural Soil	Natural silty clay soil was encountered in all locations beneath the fill, with the exception of TP113 that was terminated in fill. The natural soil extended to depths of between approximately 0.7mBGL to 1.5mBGL.
Bedrock	Siltstone bedrock was encountered beneath the natural soil and extended to the termination depths of the boreholes.
Groundwater Depth & Flow	Groundwater seepage was encountered at the base of TP113 at a depth of approximately 1.1mBGL. The remain sample locations remained dry on completion of drilling and a short time after. Groundwater monitoring wells were installed in BH1, BH2 and BH101. Groundwater monitoring wells were developed after installation on 20 May 2024 and groundwater was measured at depths of approximately 4.15mBGL (MW1) and 2.29mBGL (MW2), MW101 was dry. Groundwater was sampled on 27 May 2024 and groundwater was measured at depths of approximately 4.55mBGL (MW1), 2.13mBGL (MW2) and MW101 remained dry. The groundwater wells were not surveyed, therefore groundwater RLs were not calculated for the DSI.

The site location and regional topography indicates that excess surface water flows have the potential to enter Fishers Ghost Creek located approximately 75m to the east of the site, which is tributary to the larger Bow Bowing Creek. This water body is considered to be a potential receptor.

2.6 Summary of Site History Information

A time line summary of the historical land uses and activities is presented in the table below. The information presented in the table is based on a weight of evidence, including assessment of the site history documentation and observations made by JKE during the previous investigations.

Table 2-3: Summary of Site History Information

Year(s)	Potential Land Use / Activities
1922-1955	• Residential onsite land use; • Demolition and construction activity onsite; and • Surrounding predominantly residential, grazing and/or agricultural land uses.

Year(s)	Potential Land Use / Activities
1955-1970	• Significant residential construction onsite; • Additional residential development and construction of the original Campbelltown Catholic Club building off-site; and • Clearing of agricultural land off-site.
1970-1994	• Construction of existing northern carpark onsite; and • Ongoing development to the Campbelltown Catholic Club offsite.
1994-2005	Ongoing development to the Campbelltown Catholic Club offsite.
2005-present day	The site and immediate surrounds remained generally unchanged to the present day.

3 REVIEW OF CONCEPTUAL SITE MODEL/SITE CHARACTERISATION

NEPM (2013) defines a CSM as a representation of site related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM for the site is presented in the following sub-sections and is based on a review of information and investigation data to date. Reference should also be made to the figures attached in the appendices.

3.1 Summary of Contamination (Site Characterisation)

Asbestos in the form of bonded FCF/ACM was encountered at the surface in the eastern portion the site during DSI and sampled as FCF101, and in the western/central portion of the site adjacent the existing residential building, which was removed as part of the PSI (see Figure 3). The FCF in the eastern portion of the site appeared to be from damaged or deteriorated asbestos cement roof tiles of Emily Cottage (FCF101).

JKE note that there was a detection of AF/FA (friable) in one sample location TP110 (0-0.1m) below the SAC. Asbestos occurrences at such low concentrations are unlikely to pose an unacceptable risk to site receptors, while soil disturbance does not occur.

It is considered that the sources of asbestos contamination are likely to be from historically imported fill material, damaged/deteriorated asbestos building materials on the existing building at the site, or remnants from historical demolition activities.

Elevated concentrations of zinc above the ecological SAC was encountered in the groundwater sampled from MW2. JKE considers that the elevated zinc results are likely to be indicative of regional groundwater background concentrations rather than on on-site contamination source. Risks from groundwater are expected to be low and acceptable on the provision that any groundwater during construction dewatering is appropriately treated and managed for off-site disposal. Groundwater contamination is not considered further in the context of the RAP.

3.2 Mechanism for Contamination, Affected Media, Receptors and Exposure Pathways

The risk driving the remediation relates to bonded asbestos at the surface and potential asbestos in fill. The table below includes a review of the CSM which has been used to design the remediation strategy. The CSM will require further review if additional site data becomes available.

Table 3-1: CSM

Mechanism for contamination	The mechanism for the identified contamination in fill, includes 'top down' impacts from historical demolition of structures and/or the importation and placement of contaminated fill to level the site.
Affected media	Soil (fill) has been identified as an affected medium. It is noted that asbestos fibres can also mobilise to air. The DSI did not identify risks to groundwater. The elevated zinc results are likely to be indicative of regional groundwater background concentrations rather than on on-site contamination source. Risks from groundwater are expected to be low and acceptable on

	the provision that any groundwater during construction dewatering is appropriately managed. Therefore, groundwater is not considered in the context of this RAP.
Receptor identification	Human receptors include site occupants/users (including adults and children), construction workers and intrusive maintenance workers. Off-site human receptors include adjacent land users in a residential and commercial setting.
Exposure pathways and mechanism	Potential exposure pathways relevant to the human receptors include inhalation of dust and asbestos fibres. The potential for exposure would typically be associated with the construction and excavation works, and future use of the unpaved areas of the site. Exposure to the contaminants of concern would not occur in future in the basement/ground floor footprint in which there is no access to soil.

3.2.1 Data Gaps

The DSI acknowledged that only limited soil sampling was undertaken within the existing residential building footprint due to access constraints. This was primarily a concern with regards to the finalisation of the waste classification as this area will be excavated to construct the proposed basement.

It is also noted that previous sampling occurred from boreholes which can underestimate the concentrations of asbestos.

4 EXTENT OF REMEDIATION

For the purpose of the RAP, remediation extends across the entire area defined as the site, and applies to all fill. It is assumed all fill across the entire site is contaminated with asbestos, unless demonstrated otherwise via the validation process. Fill depths range from approximately 0.3mBGL to 1.1mBGL and the fill extends horizontally to all site boundaries.

5 REMEDIATION OPTIONS AND PREFERRED REMEDIATION STRATEGY

5.1 Soil Remediation

The NSW EPA follows the hierarchy set out in NEPM 2013 for the remediation of contaminated sites. The preferred order for soil remediation and management is as follows:

1. On-site treatment of soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level;
2. Off-site treatment of excavated material so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level, after which the soil is returned to the site;

Or if the above are not practicable:

3. Consolidation and isolation of the soil by on-site containment within a properly designed barrier; and
4. Removal of contaminated material to an approved site or facility, followed where necessary by replacement with clean material; or
5. Where the assessment indicates that remediation would have no net environmental benefit or would have a net adverse environmental effect, implementation of an appropriate management strategy.

For simplicity herein, the above hierarchy are respectively referred to as Option 1, Option 2, Option 3 etc.

The NEPM 2013 and Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2021)[10] require consideration of the following in assessing remediation options:

1. Minimisation of public risk;
2. Minimisation of contaminated soil disturbance; and
3. Minimisation of contaminated material/soil moved to landfill, including minimisation of risks associated with transportation.

The NSW EPA Contaminated Land Management Guidelines for the NSW Site Auditor Scheme (3rd Edition) (2017)[11] provides the following additional requirements to be taken into consideration:

- Remediation should not proceed in the event that it is likely to cause a greater adverse effect than leaving the site undisturbed; and
- Where there are large quantities of soil with low levels of contamination, alternative strategies should be considered or developed.

[10] Western Australian (WA) Department of Health (DoH), (2021). Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia. (referred to as WA DoH 2021)

[11] NSW EPA, (2017). *Contaminated land Management, Guidelines for the NSW Site Auditor Scheme (3rd ed.).* (referred to as Site Auditor Guidelines 2017)

5.2 Remediation Options Assessment

The table below discusses and assesses a range of remediation options:

Table 5-1: Consideration of Remediation Options

Option	Discussion	Assessment/Applicability
Option 1 **On-site treatment of contaminated soil**	On-site treatment can provide a mechanism to reuse the processed material, and in some instances, avoid the need for large scale earthworks. Treatment options are contaminant-specific and can include bio-remediation, soil washing, air sparging and soil vapour extraction, thermal desorption and physical removal of bonded ACM fragments. Depending on the treatment option, licences may be necessary for specific individual waste streams due to the potential for air pollution and the formation of harmful by-products during incineration processes. Licences for re-use of treated material/waste may also be required.	Not applicable for asbestos in soil considering the extent of the proposed basement.
Option 2 **Off-site treatment of contaminated soil**	Contaminated soils are excavated, transported to an approved/licensed treatment facility, treated to remove/stabilise the contaminants then returned to the subject site, transported to an alternative site or disposed to an approved landfill facility. This option is also contaminant-specific. The cost per tonne for transport to and from the site and for treatment is considered to be relatively high. The material would also have to be assessed in terms of suitability for reuse as part of the proposed development works under the waste and resource recovery regulatory framework.	Not applicable, as noted above.
Option 3 **Consolidation and isolation of impacted soil by cap and containment**	This would include the consolidation of contaminated soil within an appropriately designed cell, or capping contaminated soils in-situ beneath appropriate clean capping materials (such as pavement and/or clean soil) to reduce the potential for future exposure. The capping and/or containment must be appropriate for the specific contaminants of concern. A Long-Term Environmental Management Plan (LTEMP) would be required and an LTEMP would need to be publicly notified and made to be legally enforceable (e.g. via listings in the Section 10.7 planning certificate and on the land title).	In-situ capping may be applicable for areas of the site where no excavation is proposed. However, we note that the majority (>80%) of the site will require excavation for the basement and ground floor construction.

Option	Discussion	Assessment/Applicability
<u>Option 4</u> Removal of contaminated material to an appropriate facility and reinstatement with clean material	Contaminated soils would be classified in accordance with NSW EPA guidelines for waste disposal, excavated and disposed of off-site to a licensed landfill. The material would have to meet the requirements for landfill disposal. Landfill gate fees (which may be significant) would apply in addition to transport costs.	Applicable for the site and suitable for the combination of contaminants present in fill. This is the most suitable option should the potential capping of fill on-site not be feasible in conjunction with the proposed development.
<u>Option 5</u> Implementation of management strategy	Contaminated soils would be managed in such a way to reduce risks to the receptors and monitor the conditions over time so that there is an on-going minimisation of risk. This may occur via the implementation of monitoring programs.	Applicable for areas where fill remains in-situ outside of the proposed excavations areas (i.e. Emily Cottage).

5.3 Rationale for the Preferred Option for Remediation

Based on the existing data for the site, the preferred options for remediation include a combination of the following:

- Option 4 – Complete removal of contaminated material in conjunction with the basement and ground floor excavation footprints; and
- Option 5 – Asbestos removal of surface FCF/ACM of the remainder of the site outside the basement and ground floor excavation footprints, and ongoing management of these areas via a long-term EMP (EMP).

The above remediation options are considered the most appropriate for the contaminants identified in fill at the site for the following reasons:

- In consideration of the proposed development including three basement levels requiring excavation to a depth of between approximately 9.3mBGL and 12mBGL surrounding ground floor level to a depth of approximately 0.6mBGL, removal of all fill as part of this excavation (Option 4) is considered appropriate;
- The remaining areas where fill is to be retained can then be picked for any visible FCF/ACM at the surface and managed via implementation of a LTEMP; and
- The strategy is sustainable, economically viable considering it minimises soil disposal costs, commensurate with the level of risk posed by the contaminant and technically achievable to implement concurrently with the proposed development works.

6 REMEDIATION DETAILS

6.1 Roles and Responsibilities

Table 6-1: Roles and Responsibilities

Role	Responsibility
Site Owner (Campbelltown Catholic Club Limited)	The site owner is required to appoint the project team for the remediation and must provide all investigation reports and this RAP to the project coordinator, remediation contractor/principal contractor, certifier and any other relevant parties involved in the project.
Project Coordinator (To Be Confirmed)	The project coordinator is required to review all documents prepared for the project and manage the implementation of the procedures outlined in this RAP. The project coordinator is to take reasonable steps so that the remediation contractor and others have understood the RAP and will implement it in its totality. The project coordinator will review the RAP and other documents and will update the parties involved of any changes to the development or remediation sequence (in consultation with the validation consultant).
Principal Contractor / Remediation Contractor (To Be Confirmed)	The principal contractor/remediation contractor is required to review all documents prepared for the project, apply for any relevant removal licences or permits and implement the procedures outlined in this RAP. The principal contractor is to take reasonable steps so that the remediation contractor and others have understood the RAP and will implement it in its totality. The remediation contractor is required to collect all necessary documentation associated with the remediation activities and forward this documentation onto the client, project coordinator and validation consultant as it becomes available. The remediation contractor is required to advise the validation consultant at key points in the remediation and validation programme, and implement various aspects of the validation plan assigned to them. Due to the occurrence of friable asbestos in fill, the remediation contractor must be (or must subcontract) a Class A licensed asbestos removalist for any works involving disturbance/excavation of fill. It must be assumed that >10m^2 of bonded ACM is present in the soil for removal purposes.
Validation Consultant (To Be Confirmed)	The validation consultant[12] provides consulting advice and validation services in relation to the remediation. The validation consultant prepares the validation report and the LTEMP. The validation consultant is required to review any deviation to this RAP or any unexpected finds if and when encountered during the site work. The validation consultant must have a Licensed Asbestos Assessor (LAA) on staff to carry out the required asbestos clearances. The validation consultant is required to liaise with the client, project coordinator and remediation contractor on all matters pertaining to the site contamination, remediation and validation, carry out the required site inspections, and collect validation samples for remedial excavations.

[12] The validation consultant must be a certified practitioner (specialising in site contamination), under one of the NSW EPA endorsed certification schemes, i.e. CEnvP SC or equivalent

6.2 Pre-commencement Meeting

The project team is to have a pre-commencement meeting to discuss the sequence of remediation, and the remediation and validation tasks. The site management plan for remediation works (see Section 9) should be reviewed by project coordinator and remediation contractor, and appropriate steps are to be taken to ensure the adequate implementation of the plan.

6.3 Summary of Remediation, Validation and Associated Tasks

The following general sequence of works is anticipated:

- **Hold Point** - Preparation and implementation of an AMP for the remediation/proposed development works;
- Site establishment;
- Demolition/removal of structures and pavements;
- Pre-remediation waste classification sampling and reporting;
- Remediation (and validation) of the basement and ground floor footprint via off-site disposal of fill, and validation of this process (see indicative area on Figure 2 in Appendix A);
- Pick and removal of surficial ACM/FCF (this can occur with the above where appropriate), followed by clearance inspection and certificate issued by a LAA, and implementation of an LTEMP for any contaminated fill to be retained (see indicative area on Figure 2 in Appendix A);
- Validation of any imported materials in combination with the tasks above; and
- Preparation of a site validation report.

6.3.1 Construction-Phase Asbestos Management Plan (AMP)

A Construction-Phase AMP must be prepared for the site by a Class A asbestos removal contractor (or their nominated sub-consultant), or by the validation consultant, and implemented for the site demolition, remediation and development works. The AMP should include the minimum personal protective equipment (PPE), work health and safety (WHS) and other requirements outlined in the documents published by Safe Work Australia, WorkCover Authority of NSW, National Occupational Health and Safety Commission, and other relevant authorities as applicable.

6.3.2 Site Establishment

The remediation contractor is to establish on site as required to facilitate the remediation. Consideration must be given to the work sequence and extent of remediation so that the site establishment (e.g. site sheds, fencing, access points etc) does not inhibit the remediation works.

The validation consultant must be advised if any soil, gravel or engineering materials (e.g. DGB, roadbase etc) are to be imported for the site establishment works. These must be validated by the validation consultant in accordance with Section 7.1.3 of this RAP to confirm they are suitable to be imported to site.

6.3.3 Demolition of Structures and Pavements

A hazardous building materials survey is to be undertaken prior to demolition. The demolition is to occur with regards to the findings of the hazardous building materials survey and must be undertaken in accordance with the relevant codes, standards, guidelines and regulations. All structures and materials are to be removed from the site and clearance certificates are to be provided for the removal of all hazardous materials.

A clearance certificate is to be obtained by the demolition contractor following the removal of any hazardous materials from the building and structures (i.e. asbestos). The concrete slabs should be inspected for potential ACM post-demolition by a LAA.

Following removal of slabs, a site inspection must be completed by the validation consultant on completion of demolition to identify any additional sources of contamination (such as asbestos in/on fill, building waste/foreign materials, or others).

All demolition waste is to be segregated in accordance with AS2601-2017, and be disposed of at facilities that are licenced by the NSW EPA to accept the waste. The demolition contractor is to maintain adequate records and retain all documentation for such activities including:

- A summary register including details such as waste disposal dates, waste materials descriptions, disposal locations (i.e. facility details) and reconciliation of this information with waste disposal docket numbers;
- Waste tracking records and transport certificates (where waste is required to be tracked/transported in accordance with the regulations); and
- Disposal dockets for the waste. Legible dockets are to be provided for all waste materials so they can be reconciled with the register.

The above information is to be supplied to the validation consultant for assessment and inclusion in the site validation report.

6.3.4 Pre-remediation Waste Classification

Following removal of the existing building and associated slabs, the pre-remediation waste classification is to be undertaken within the building footprint. The waste classification will include collection and analysis of soil samples from additional sampling locations. Additional samples are to be collected if any visual or olfactory indicators of potential contamination are observed. The locations must target previously inaccessible area within the footprint of the existing building and slab. Soil sampling is to be undertaken from test pits using an excavator.

As a minimum, one soil sample per fill profile encountered (at each location) is to be analysed for heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), TRH/BTEX, PAHs, OCPs, OPPs and asbestos (500mL quantification sample). A bulk (10L) sample (to the extent achievable based on sample return) from each fill profile encountered (at each location) is to be screened in the field for the presence of asbestos.

As a minimum, one sample of the natural profile is to be collected from each sampling location and is to be analysed for heavy metals, TRH/BTEX and PAHs for waste classification purposes.

On completion of the soil sampling, a report is to be prepared presenting the results of the additional waste classification. The report will also capture waste classification/soil results from the PSI and DSI reports and provide a final waste classification for the fill and natural soils at the site.

6.3.5 Remediation – Excavation and Disposal of Contaminated Fill

The project team must carefully consider the sequence of works and requirements in relation to any temporary shoring, piling and the excavation/remediation of fill. If practicable (and subject to consideration of relevant geotechnical and construction-related constraints etc), we recommend from a contamination standpoint that the fill be excavated/removed prior to the commencement of any piling associated with the proposed basement so that piling does not occur through the fill, creating a mixed waste stream that will be more costly for disposal purposes.

Whilst the procedure below relates to the excavation and disposal remediation area (see Figure 2 in Appendix A), it is noted that some fill may also need to be removed from outside this area (see Figure 2 in Appendix A) in order to achieve the desired levels for ancillary landscaping around Emily Cottage. The excavation of fill from the site to achieve successful remediation must be carefully planned and we recommend that, where possible, all required excavation/fill removal occurs concurrently early in the remediation/construction sequence.

The procedure for excavation and disposal of fill from the site is outlined in the table below:

Table 6-2: Remediation Details – Excavation and Disposal

Step	Primary Role/ Responsibility	Procedure
1.	Remediation contractor	<u>Site Management and Geotechnical/Stability:</u> The remediation contractor is to take steps to ensure the AMP, site management plan in this RAP are implemented for the remediation works. The remediation contractor/licensed asbestos removalist must notify SafeWork NSW of the intent to remove friable and bonded asbestos to SafeWork NSW at least five days prior to the commencement of asbestos removal. Tracking arrangements must be made for the waste disposal. Geotechnical advice must be sought regarding the stability of the adjacent roadways and/or adjacent areas prior to commencing remediation (as required). Stability issues must be addressed to the satisfaction of a suitably qualified geotechnical engineer. This may require the installation of temporary shoring systems. All underground services are to be appropriately disconnected and/or rerouted to facilitate the works.
2.	Remediation contractor (or nominated licenced sub-contractor)	<u>Establish Asbestos Related Controls and Arrange Licenses and Tracking Requirements:</u> Prior to the commencement of any excavation of asbestos impacted fill soil, asbestos related controls, licences and tracking requirements should be implemented as outlined in the AMP.
3.	Validation Consultant	<u>Waste Classification Letter</u> A waste classification letter for fill/soil must be prepared to confirm the final expected waste quantities and the waste classification of the fill/soil to be excavated and removed from the site.
4.	Remediation contractor and validation consultant	<u>Removal of Contaminated Fill:</u> Remediation will be undertaken as follows: • Submit an application to dispose of the fill (in accordance with the assigned waste classification) to a facility that is appropriately licensed by the NSW EPA to receive the waste, and obtain authorisation to dispose; • The fill within the basement and ground floor footprints of the proposed development is to be excavated to the full extent (i.e. the entire fill profile) and removed, down to the top of the underlying natural soil. This is expected to result in excavations extending to depths in the order of approximately 0.2mBGL to 1mBGL, depending on the location of the excavation (based on the fill depths encountered during the DSI); • Experienced personnel must monitor the fill excavation process so that fill is not 'over excavated' into natural soil which could result in additional and unnecessary landfill fees. The details of the excavation works will need to be agreed with the remediation contractor. The works should be done in the most efficient manner that minimises cross contamination; • Load the fill directly into trucks and dispose of the soil to a facility licensed by the NSW EPA to receive the waste (the landfill will require a copy of the waste classification report refer to Item 2 above); and • All documents including landfill disposal dockets must be retained by the remediation contractor and forwarded to the client and validation consultant. This documentation forms a key part of the validation process and is to be included in the validation report.

Step	Primary Role/ Responsibility	Procedure
		The remedial excavation works must be inspected/witnessed on a regular (daily) basis by the validation consultant. In our experience, this can reduce the potential for over-excavation which can lead to increased disposal costs, and also decrease the potential for validation failure due to inadequate removal of fill.
5.	Remediation contractor and validation consultant	Validation of Excavations: Following completion of the fill excavation/removal, the validation consultant is to obtain validation samples in accordance with the validation plan in Section 7.1 of this RAP and an asbestos clearance of the footprint of the remediation area is to occur.

6.3.6 Remediation – Pick and Removal of ACM/FCF

ACM was encountered at the ground surface around the existing Emily Cottage and was deemed to be a result of damaged or deteriorated ACM roof tiles from the cottage. Therefore, the areas of the site outside the proposed basement and ground-floor excavation footprints are to be picked of any visible, surficial ACM/FCF from the ground surface by an appropriately licensed asbestos removal contractor. Once complete a clearance inspection is to be undertaken by a LAA and a clearance certificate issued for the ground surface in these areas.

As there is a potential for some bonded ACM/FCF contaminated soil is to remain on site, a long-term AMP will be required to manage the contamination capped at the site and the long-term EMP will be documented as part of the overall validation process. Public notification and enforcement mechanisms for the long-term AMP and EMP are to be arranged in consultation with the consent authority.

6.4 Remediation Documentation

The remediation contractor must retain all documentation associated with the remediation, including but not limited to:

- Waste disposal dockets and register (see below);
- Waste tracking documentation (see below and the example waste tracking form in Appendix D);
- Asbestos management documentation, including any clearances and all relevant notifications and air monitoring reports (additional details in this regard are to be outlined in the AMP);
- Photographs of remediation works; and
- Imported materials documentation from suppliers, including any routine analysis reports, product specifications and dockets/register (see below and the example imported material tracking form in Appendix D) for imported materials.

Copies of these documents must be forwarded to the project coordinator and the validation consultant on completion of the remediation for inclusion in the validation report.

6.4.1 Waste Register

All waste removed from the site is to be appropriately tracked and managed in accordance with the relevant regulations. The remediation contractor (and/or their nominated construction contractor) is to maintain adequate records and retain all documentation for waste disposal activities including:

- A summary register including details such as waste disposal dates, waste materials descriptions, disposal locations (i.e. facility details, including each facility's Environment Protection Licence number) and reconciliation of this information with the associated waste classification documentation and the waste disposal docket numbers; and
- Waste tracking records and transport certificates (where waste is required to be tracked/transported in accordance with the regulations); and
- Disposal dockets for the waste(i.e. weighbridge dockets for each load). Legible dockets are to be provided for all waste materials so they can be reconciled with the register.

Any soil waste classification documentation is to be prepared in accordance with the reporting requirements specified by the NSW EPA as outlined in the Consultants Reporting Guidelines and the NSW EPA Waste Classification Guidelines (2014). The documentation must be reviewed by the validation consultant (if the documentation is prepared by others) prior to the waste leaving the site.

A review of the disposal facility's Environment Protection Licence (EPL) issued under the Protection of the Environment Operations (POEO) Act (1997)[13] is to be undertaken to assess whether the facility is appropriately licensed to receive the waste.

The above information is to be provided to the validation consultant for inclusion in the validation report. The register must be set up at the beginning of the project and provided to the validation consultant regularly (i.e. weekly) so the details can be checked and any rectification of the record keeping process can occur in a timely manner.

A soil volume analysis should be undertaken on completion of remediation and reconciled with the quantities shown on the soil disposal dockets. This information is to be reviewed by the validation consultant on completion of the works and an assessment of the quantities of soil disposed off-site (e.g. comparison with the estimated and actual volumes) is to be included in the validation report.

6.4.2 Imported Materials Register

The remediation contractor (and/or their nominated construction contractor) is to maintain for the duration of the project an imported material register. This must include a register (in Microsoft Excel format) with details of each imported material type, supplier details, summary record of where the imported materials were placed on site, and importation docket numbers and a tally of quantities (separated for each import stream). Legible dockets for imported materials are to be provided electronically so these can be reconciled with the register.

[13]NSW Government, (1997). *Protection of Environment Operations Act.* (referred to as POEO Act 1997)

Examples of imported materials for this project may include but would not be limited to: site preparation materials (e.g. DGB, 40/70, material to create the piling platform etc); and landscaping materials such as topsoil garden mixes, mulches etc.

The above information is to be provided to the validation consultant for inclusion in the validation report. It is recommended that the register be set up at the beginning of the project and provided to the validation consultant regularly (say weekly) so the details can be checked and any rectification of the record keeping process can occur in a timely manner.

An example imported materials register is attached in Appendix D.

7 VALIDATION PLAN

Validation is necessary to demonstrate that remedial measures described in the RAP have been successful and that the site is suitable for the intended land use. The sampling program for the validation is outlined in Section 7.1. This is the minimum requirement based on the remedial strategies provided. Additional validation sampling may be required based on observations made during remediation.

7.1 Validation Sampling and Documentation

7.1.1 Excavation/Fill Removal – Basement and Ground Floor Footprint

Following the complete removal of fill from the basement and ground floor footprint remediation area, the following validation will occur:

- Soil samples (and/or rock if rock is exposed) must be collected across the base of the excavation, for analysis of 500mL asbestos on a 20m x 20m grid;
- Sample collection from the excavation walls may not be possible due to the construction methods used (piling), however a visual inspection of exposed fill for the presence of ACM/FCF should be undertaken and observations recorded;
- The validation consultant must document and confirm that the base of the entire excavation (i.e. the entire site) includes no remnant fill and only exposed natural/virgin soil or bedrock; and
- The validation consultant's LAA must provide an asbestos clearance certificate for the exposed soil surfaces on the base and walls of the remedial excavation, confirming there is no visible FCF.

The validation consultant is to document the excavation photographically and confirm that the fill was removed from the relevant areas. A description of each sample is to be recorded.

Where the validation is acceptable, a waste classification is to be assigned to the remaining natural soil/rock to be excavated and the excavation works can continue as required for the proposed development.

7.1.2 Pick and Removal – Outside the Basement and Ground Floor Footprint

The validation assessment for the capped areas requires adequate removal of all visible, accessible ACM/FCF from the surface the areas outside the proposed excavation footprint. Appropriately licensed removalists must undertake the removal work and a NSW LAA must undertake a visual clearance of the ground surface in these areas prior to any further work continuing.

7.1.3 Imported Materials

A minimum of three samples per 75m^2 from each imported material type must be collected and analysed for heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), TRHs, benzene, toluene, ethylbenzene and xylenes (BTEX), polycyclic aromatic hydrocarbon (PAH), organochlorine and organophosphate pesticides (OCPs/OPPs), polychlorinated biphenyls (PCBs) and asbestos (500ml NEPM 2013 analysis). The assessment of mulch can be limited to asbestos only (500ml) provided there is no soil component. Additional analysis may be required depending on the material type and/or history of the material/source site, at the validation consultant's discretion.

Material is to be inspected upon importation by the validation consultant to confirm it is free of visible/olfactory indicators of contamination and is consistent with documentation. Photographic documentation and an inspection log are to be maintained. A minimum of one inspection must occur for each imported material type from each different source.

Where applicable (e.g. where the imported material is a waste or recycled product), documentation must be supplied to the validation consultant to confirm the material has been classified with reference to a relevant Resource Recovery Order/Exemption and/or the NSW EPA waste classification guidelines.

7.2 Validation Assessment Criteria and Data Assessment

The VAC to be adopted for the validation assessment are outlined in the table below:

Table 7-1: VAC

Validation Aspect	VAC
Remediation area – following excavation and disposal of fill	<u>For asbestos:</u> The HSL-D criteria will be adopted for the assessment of asbestos in soil. The SAC adopted for asbestos are derived from the NEPM 2013 and based on the Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2021)[14]. The SAC include the following: • No visible asbestos at the surface/in the top 10cm of soil; • <0.05% w/w bonded asbestos containing material (ACM) in soil; and • <0.001% w/w asbestos fines/fibrous asbestos (AF/FA) in soil. Qualitative/visual – base and walls of excavation must be free of visible ACM/FCF, verified by the LAA asbestos clearance certificate. The base of the excavation must also be confirmed to include only natural soil or bedrock (no remnant fill or debris) where complete fill removal is proposed. The qualitative VAC for soil validation are as follows: • Visual confirmation of complete fill removal from the excavation area so that no fill remains at the base of the remedial excavation; • Visual confirmation that the walls of the excavation area are free of visible ACM/FCF, verified by the LAA; and • Visual confirmation of no visible asbestos by the LAA, via the asbestos clearance certificate. It is noted that the above criteria are not appropriate to classify the natural soil/bedrock to be excavated from the basement as virgin excavated natural material (VENM). Any natural soil and bedrock to be disposed off-site must meet the definition of VENM presented in the waste classification guidelines and the POEO Act 1997.
Imported materials	All materials imported onto the site must also be adequately assessed as being appropriate for the final use of the site. A risk-based assessment approach is to be adopted with regards to the tier 1 screening criteria presented in Schedule B1 of NEPM 2013.

[14] Western Australian (WA) Department of Health (DoH), (2021). *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*. (referred to as WA DoH 2021)

Validation Aspect	VAC
	All results for imported materials are to be compared to the HIL/HSL-B criteria in NEPM 2013 to check they do not pose a risk to human health in the proposed land use scenario. Asbestos must be absent. Landscaping materials must also be assessed against the urban residential and public open space EIL/ESL criteria to check they do not pose a risk to ecological receptors. Results for VENM and other imported materials will need to be consistent with expectations for those materials. VENM must meet the definition presented in the waste classification guidelines and the POEO Act 1997. Recycled materials are to meet the criteria of the relevant exemption/order under which they are produced. Aesthetics: soils to be free of staining and odours.

7.3 Validation Sampling, Analysis and Quality Plan (SAQP)

Data Quality Objectives (DQOs) and Data Quality Indicators (DQIs) should be clearly outlined and assessed as part of the validation process. A framework for the DQO and DQI process is outlined below and should be reflected in the validation report.

DQOs have been broadly established for the validation with regards to the seven-step process outlined NEPM (2013). The seven steps include the following which are detailed further in the following subsections:

- State the problem;
- Identify the decisions/goal of the study;
- Identify information inputs;
- Define the study boundary;
- Develop the analytical approach/decision rule;
- Specify the performance/acceptance criteria; and
- Optimise the design for obtaining the data.

DQIs are to be assessed based on field and laboratory considerations for precision, accuracy, representativeness, completeness and comparability.

7.3.1 Step 1 - State the Problem

Validation data is required to demonstrate that the remediation is successful and that the site is suitable for the proposed land use described in Section 1.1.

Validation data for imported materials is required to demonstrate that the site is not inadvertently impacted by importing contaminated material during the construction process.

7.3.2 Step 2 - Identify the Decisions of the Study

The remediation goal, aims and objectives are defined in Section 1.2. The decisions to be made reflect these objectives and are as follows:

- Was the remediation undertaken in accordance with the RAP?
- If there were any deviations, what were these and how do they impact the outcome of the validation?
- Are any of the validation results above the VAC?
- Was the remediation successful and is the site suitable for the proposed development from a contamination viewpoint?

7.3.3 Step 3 - Identify Information Inputs

The primary information inputs required to address the decisions outlined in Step 2 include the following:

- Existing relevant data from previous reports;
- Site information, including site observations, inspections, waste and imported materials registers;
- Validation sampling and analysis;
- Field and laboratory QA/QC data; and
- Records relating to unexpected finds (where applicable).

7.3.4 Step 4 - Define the Study Boundary

The remediation and validation (and the resulting validation report/LTEMP/AMP) will be confined to the site boundaries.

7.3.5 Step 5 - Develop an Analytical Approach (or Decision Rule)

7.3.5.1 VAC

The validation data will be assessed in accordance with the requirements outlined in Section 7.1 and 7.2. The data will be assessed as either above (fail) or below (pass) the VAC.

Statistical analysis is not considered to be appropriate for imported materials. Additionally, statistical analysis is not intended to be applied for in-situ validation, as results above the VAC are not considered to be supportive of a situation where all contaminated fill has been adequately removed.

7.3.5.2 Field and Laboratory QA/QC

Field QA/QC is to include analysis of inter-laboratory duplicates (5% frequency), intra-laboratory duplicates (5% frequency), trip blank (one per daily sampling event) and rinsate samples (one per sampling event, only where re-usable equipment is utilised). No trip spike samples will be obtained during on-site validation works as these are not suitable for asbestos, lead or carcinogenic PAH analysis. However, these must be obtained if sampling imported materials as applicable.

DQIs for field and laboratory QA/QC samples are defined below:

Field Duplicates

Acceptable targets for precision of field duplicates will be 30% or less, consistent with NEPM (2013). RPD failures will be considered qualitatively on a case-by-case basis taking into account factors such as the concentrations used to calculate the RPD (i.e. RPD exceedance where concentrations are close to the PQL are typically not as significant as those where concentrations are reported at least five or 10 times the PQL), sample type, collection methods and the specific analyte where the RPD exceedance was reported.

Trip Blanks

Acceptable targets for trip blank samples will be less than the PQL for organic analytes. Metals will be considered on a case-by-case basis with regards to the reference material used as the blank medium.

Acceptable targets for trip spike samples will be 70% to 130%.

Laboratory QA/QC

The suitability of the laboratory data will be assessed against the laboratory QA/QC criteria. These criteria are developed and implemented in accordance with the laboratory's NATA accreditation and align with the acceptable limits for QA/QC samples as outlined in NEPM (2013) and other relevant guidelines.

A summary of the typical limits is provided below:

RPDs

- Results that are <5 times the PQL, any RPD is acceptable; and
- Results >5 times the PQL, RPDs between 0-50% are acceptable.

Laboratory Control Samples (LCS) and Matrix Spikes

- 70-130% recovery acceptable for metals and inorganics; and
- 60-140% recovery acceptable for organics.

Surrogate Spikes

- 60-140% recovery acceptable for general organics.

Method Blanks

- All results less than PQL.

In the event that acceptable limits are not met by the laboratory analysis, other lines of evidence will be reviewed (e.g. field observations of samples, preservation, handling etc) and, where required, consultation with the laboratory is to be undertaken in an effort to establish the cause of the non-conformance. Where uncertainty exists, the validation consultant is to adopt the most conservative concentration reported.

7.3.5.3 Appropriateness of PQLs

The PQLs of the analytical methods are to be considered in relation to the VAC to confirm that the PQLs are less than the VAC. In cases where the PQLs are greater than the VAC, a discussion of this is to be provided.

7.3.6 Step 6 – Specify Limits on Decision Errors

To limit the potential for decision errors, a range of quality assurance processes are adopted. A quantitative assessment of the potential for false positives and false negatives in the analytical results is to be undertaken with reference to Schedule B(3) of NEPM (2013) using the data quality assurance information collected. Quantitative limits on decision errors have not been established for the validation data as statistical analysis is not proposed.

7.3.7 Step 7 - Optimise the Design for Obtaining Data

The design is to be optimised via the collection of validation data to demonstrate the success of the key aspects of the remediation. Data collection will be via various methods including inspections/clearances, sampling and laboratory analysis.

7.3.8 Sampling Plan

The proposed sampling plan is described in Section 7.1.

7.4 Validation Report and LTEMP/AMP

As part of the site validation process, a site validation report will be prepared by the validation consultant on completion of the remediation and validation works. The report will present the results of the validation assessment and will be prepared in accordance with the Consultants Reporting Guidelines. The report must clearly state whether or not the site has been adequately remediated and validated, and whether or not the site is suitable for the proposed development from a contamination viewpoint.

Validation of imported materials must occur until completion of all works.

As potentially asbestos contaminated fill is to be retained on-site, a LTEMP and AMP will be required to manage the potential for asbestos contamination and the LTEMP/AMP will be documented as part of the overall validation process. The LTEMP/AMP will also include contingencies for managing minor intrusive works.

8 CONTINGENCY PLAN

A review of the proposed remediation works has indicated that the greatest risks that may affect the success of the remediation include identification of unexpected finds. Contingency plans to address these risks are outlined below, in conjunction with a selection of other contingencies that may apply to this project.

8.1 Unexpected Finds

Residual hazards that may exist at the site would generally be expected to be detectable through visual or olfactory means. Unexpected finds may include, but would not necessarily be limited to, the following: stained or odorous soils; and underground infrastructure such as tanks or separator pits etc.

The procedure to be followed in the event of an unexpected find is presented below:

- In the event of an unexpected find, all work in the immediate vicinity should cease and the remediation contractor must contact the validation consultant, the client and the project coordinator and advise them of the find;
- Temporary barricades should be erected to isolate the area from access to workers;
- The validation consultant is to attend the site, assess what is required to characterise the contamination, develop a suitable plan to facilitate this, and advise the client and the project coordinator of these anticipated requirements;
- The validation consultant is then to adequately characterise the contamination and provide advice in relation to site management and remediation. In the event that remediation differs from the procedures outlined in the RAP, an addendum RAP or Remedial Works Plan (RWP) must be prepared in consultation with the project stakeholders and (where required) submitted to the consent authority; and
- Contamination should be remediated and validated in accordance with the advice provided, and the results must be included in the site validation report.

8.2 Importation Failure for VENM or other Imported Materials

Where material to be imported onto the site does not meet the importation VAC detailed in Section 7, the material should not be imported. Alternative material must be sourced that meets the importation requirements.

8.3 Validation Failure

In the event that a validation sample exceeds the VAC, additional material must be 'chased out' and disposed off-site, then the area re-validated. Prior to the chase out of additional material, the remediation contractor/principal contractor must advise the project coordinator and client, and seek approval. Any additional engineering requirements must also be addressed so the work occurs safely and does not result in any damage or instability issues.

9 SITE MANAGEMENT PLAN FOR REMEDIATION WORKS

The information outlined in this section of the RAP is for the remediation work only. The client should make reference to the development consent for specific site management requirements for the overall development of the site.

9.1 Construction-Phase Asbestos Management Plan (AMP)

A Construction-Phase AMP must be prepared for the site by a suitably qualified consultant and implemented for the site remediation and construction works. The AMP must include the minimum PPE, WHS and other requirements outlined in the documents published by Safe Work Australia, WorkCover Authority of NSW, National Occupational Health and Safety Commission, and other relevant authorities as applicable.

An Asbestos Removal Control Plan (ARCP) must be prepared by the remediation contractor and issued to SafeWork, and notification of asbestos removal is to be provided to SafeWork at least five days prior to commencement of works.

It is recommended that air monitoring be included in the AMP due to the close proximity of adjoining residential properties and the operating Campbelltown Catholic Club. Air monitoring must only be carried out by personnel registered and accredited by NATA (National Association of Testing Authorities). Filter analysis must only be carried out within a NATA certified laboratory. The monitoring results must conform to the requirements of the NOHSC Guidance note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition [NOHSC:3003 (2005)].

A monitoring program will be used to assess whether the control procedures being applied are satisfactory and that criteria for airborne asbestos fibre levels are not being exceeded. The following levels will be used as action criteria during the air monitoring:

- <0.01 Fibres/ml: Work procedures deemed to be successful;
- 0.01 to 0.02 Fibres/ml: Inspection of the site and review of procedures; and
- >0.02 Fibres/ml: Stop work, inspection of the site, review of procedures, clean-up, rectification works where required and notify the relevant regulator.

9.2 Interim Site Management

Based on the current site layout and in consideration of the site's on-going use as car park and residential property, JKE recommend implementing interim management measures in the areas where there is exposed soil at the surface to mitigate the immediate risks to site users posed by the asbestos contamination identified at the site. This is to include the following measures:

- Undertake an 'emu pick' of the area around Emily Cottage and the residential property at the site for fragments of FCF/suspected ACM at the surface of the site. The pick should be conducted by a suitably licensed asbestos contractor. On completion of the pick, a clearance certificate should be issued by a competent person or NSW Licensed Asbestos Assessor to ensure the area is free of visible asbestos;
- Ensure garden beds or areas of exposed soil are suitably covered with mulch are grass cover;

- Restrict gardening/maintenance activities in the area around Emily Cottage and the residential property until such time as the soil can be remediated and/or the risk of exposure can be eliminated; and
- An AMP for the site should be prepared and implemented. The AMP will provide guidance on management of known asbestos at the site.

9.3 Project Contacts and Signage

Emergency procedures and contact telephone numbers should be displayed in a prominent position at the site entrance gate and within the main site working areas. These details are to be confirmed when the various roles and responsibilities are assigned.

A sign displaying the contact details of the remediation contractor and site manager (if different from the remediation contractor) must be displayed on the site adjacent to the site access, including a contact telephone number that is available 24 hours a day, 7 days a week. The sign must be clearly legible from the street and be displayed for the duration of the remediation works.

9.4 Security

Appropriate fencing should be installed as required to secure the site. Warning signs should be erected, which outline the PPE required for remediation work. Reference must also be made to the AMP in this regard.

9.5 Timing and Sequencing of Remediation Works

The anticipated sequence of remediation works is outlined in Section 6.3. The project team must meet and discuss the timing and sequencing of the works prior to the commencement of remediation.

9.6 Site Soil and Water Management Plan

The remediation contractor must prepare a detailed soil and water management plan prior to the commencement of site works and this must consider the requirements of the AMP. Silt fences should be used to control the surface water runoff at all appropriate locations of the site and appropriate measures are to be implemented to manage soil/water disturbance to the satisfaction of the regulator/consent authority.

All stockpiled materials should be placed within an erosion containment boundary with silt fences and sandbags employed to limit sediment movement. The containment area should be located away from drainage lines/low-points, gutters, stormwater pits and inlets and the site boundary. No liquid waste or runoff should be discharged to the stormwater or sewerage system without the approval of the appropriate authorities.

Vehicle access to the site shall be stabilised to prevent the tracking of sediment onto the roads and footpath. Soil, earth, mud or similar materials must be removed from the roadway by sweeping, shovelling, or a means other than washing, on a daily basis or as required. Soil washings from wheels shall be collected and disposed of in a manner that does not pollute waters.

9.7 Noise and Vibration Control Plan

The guidelines for minimisation of noise on construction sites outlined in AS-2460 (2002)[15] should be adopted. The remediation work shall comply with the EPA Environmental Noise Manual for the control of construction site noise which specifies that:

- For a cumulative period of exposure to construction activity noise of up to four weeks, the LA10 (15 minutes) emitted by the works to specific residences should not exceed the LA90 background level by more than 20 dBA;
- For a cumulative construction noise exposure period of between four to 26 weeks, the emitted LA10 noise level should not exceed the LA90 level by more than 10 dBA; and
- For a cumulative construction noise exposure period greater than 26 weeks, the emitted LA10 noise level should not exceed the LA90 level by more than 5 dBA.

All practicable measures are to be taken to reduce the generation of noise and vibration to within acceptable limits. In the event that short-term noisy operations are necessary, and where these are likely to affect residences, notifications should be provided to the relevant authorities and the residents by the project coordinator, specifying the expected duration of the noisy works.

9.8 Dust Control Plan

All practicable measures should be taken to reduce dust emanating from the site. Factors that contribute to dust production are:

- Wind over a cleared surface;
- Wind over stockpiled material; and
- Movement of machinery in unpaved areas.

Visible dust should not be present at the site boundary. Measures to minimise the potential for dust generation include:

- Use of water sprays on unsealed or exposed soil surfaces;
- Covering of stockpiled materials and excavation faces (particularly during periods of site inactivity and/or during windy conditions) or alternatively the erection of hessian fences around stockpiled soil or large exposed areas of soil;
- Establishment of dust screens consisting of a 2m high shade cloth or similar material secured to a chain wire fence;
- Maintenance of dust control measures to keep the facilities in good operating condition;
- Stopping work during strong winds;
- Loading or unloading of dry soil as close as possible to stockpiles to prevent spreading of loose material around the development area; and
- Geofabric should be placed over exposed soils in the event that excavation is staged.

If stockpiles are to remain on-site or soil remains exposed for a period of longer than several days, dust monitoring should be undertaken at the site. If excessive dust is generated all site activities should cease

[15] Australian Standard, (2002). *AS2460: Acoustics - Measurement of the Reverberation Time in Rooms.*

until either wind conditions are more acceptable or a revised method of excavation/remediation is developed.

Dust is also produced during the transfer of material to and from the site. All material should be covered during transport and should be properly disposed of on delivery. No material is to be left in an exposed, un-monitored condition.

All equipment and machinery is to be brushed or washed down before leaving the site to limit dust and sediment movement off-site. In the event of prolonged rain and lack of paved areas all vehicles should be washed down prior to exit from the site, and any soil or dirt on the wheels of the vehicles removed. Water used to clean the vehicles should be collected and tested prior to appropriate disposal under the relevant waste classification guidelines.

Reference must also be made to the AMP in this regard.

9.9 Dewatering

Dewatering is not expected to be required within the scope of remediation as the remedial excavations to remove the contaminated fill are expected to be shallow. In the event that dewatering is required during construction, WaterNSW must be contacted to provide additional details regarding the approval process.

Any construction-phase dewatering is to occur with due consideration to the relevant guidelines and legislation. Groundwater must not be pumped to sewer or stormwater without obtaining prior approval from the relevant authorities. The groundwater will require some level of treatment prior to discharge. Or alternatively, pumped groundwater would need to be stored appropriately then removed by a liquid waste contractor.

9.10 Odour Control Plan

All activities undertaken at the site should be completed in a manner that minimises emissions of smoke, fumes and vapour into the atmosphere and any odours arising from the works or stockpiled material should be controlled. Control measures may include:

- Maintenance of construction equipment so that exhaust emissions comply with the Clean Air Regulations issued under the POEO Act 1997;
- Demolition materials and other combustible waste should not be burnt on site;
- The spraying of a suitable proprietary product to suppress any odours that may be generated by excavated materials; and
- Use of protective covers (e.g. builder's plastic).

All practicable measures should be taken to reduce fugitive emissions emanating from the site so that associated odours do not constitute a nuisance and that the ambient air quality is not adversely impacted.

The following odour management plan should be implemented to limit the exposure of site personnel and surrounding residents to unpleasant odours:

- Excavation and stockpiling of material should be scheduled during periods with low winds if possible;
- A suitable proprietary product could be sprayed on material during excavation and following stockpiling to reduce odours (subject to an appropriate assessment of the product by the validation consultant);
- All complaints from workers and neighbours should be logged and a response provided. Work should be rescheduled as necessary to minimise odour problems;
- The site foreman should consider the following odour control measures as outlined in NEPM:
  - reduce the exposed surface of the odorous materials;
  - time excavation activities to reduce off-site nuisance (particularly during strong winds); and
  - cover exposed excavation faces overnight or during periods of low excavation activity.
- If continued complaints are received, alternative odour management strategies should be considered and implemented.

9.11 Work Health and Safety (WHS) Plan

A site specific WHS plan should be prepared by the remediation contractor for all work to be undertaken at the site. The WHS plan should meet all the requirements outlined in SafeWork NSW WHS regulations.

As a minimum requirement, personnel must wear appropriate protective clothing, including long sleeve shirts, long trousers, steel cap boots and hard hats. Additional asbestos-related PPE will be required and this will be specified in the AMP, where applicable for any work involving asbestos.

9.12 Waste Management

Prior to commencement of remedial works and excavation for the proposed development, the remediation contractor should develop a waste management or recycling plan to minimise the amount of waste produced by the site. The plan must incorporate the requirements documented in Section 6.4.1 of this RAP.

9.13 Incident Management Contingency

The client/project coordinator and validation consultant must be contacted if any unexpected contamination-related conditions are encountered at the site. This should enable the scope of works to be adjusted as required. Similarly, if any incident occurs at the site, the validation consultant should be advised to assess potential impacts on contamination conditions and provide advice as necessary.

9.14 Hours of Operation

Reference is to be made to the development consent for the hours of operation.

9.15 Community Consultation and Complaints

The remediation contractor should provide details for managing community consultation and complaints within their Construction Plans.

10 CONCLUSION

Investigations at the site by JKE has identified asbestos in and on fill that represents a potential risk to human receptors during site development/excavation works and future site use.

The proposed remediation strategy includes excavation and off-site disposal of the contaminated fill from with the proposed basement and ground floor footprints to a licensed landfill facility, and surficial removal of ACM/FCF across the ground surface of the remainder of the site, and on-going management. The anticipated sequence of remediation works is outlined in Section 6.3 of this RAP. Remediation will be deemed complete following the successful removal of contaminated fill and validation of this process. It is noted that capping will occur concurrently with the construction of the built form of the development and the project team must consult with the consent authority so that this is appropriately considered in the development consent conditions.

JKE is of the opinion that the risk posed by contamination at the site can be managed during construction and reduced to an acceptable level for the proposed development via remediation and the implementation of this RAP.

A site validation report is to be prepared on completion of remediation activities to demonstrate that the site is suitable for the proposed development from a contamination risk perspective. A LTEMP/AMP will be prepared as part of the validation process to manage the potential for asbestos contamination impacts on-site. JKE is of the opinion that the RAP has met the objectives outlined in Section 1.2 and we consider that the site will be rendered suitable for the proposed development subject to the appropriate implementation of the RAP.

The regulatory requirements applicable for the site are outlined in Section 10.1.

10.1 Regulatory Requirements

The regulatory requirements applicable for the remediation are discussed in the following table:

Table 10-1: Regulatory Requirement

Guideline / Legislation / Policy	Applicability
SEPP Resilience and Hazards (incorporating the former SEPP55)	The client's expert planner must confirm whether the remediation falls within Category 1 or Category 2 under SEPP Resilience and Hazards 2021. Based on our initial assessment, JKE has assessed that the remediation falls within Category 1 as the land is mapped as being in a heritage conservation area. A notice of completion of remediation work is to be given to council within 30 days of completion of the work. The notice of completion of remediation works must be in accordance with Chapter 4 of SEPP Resilience and Hazards 2021.
POEO Act 1997	Section 143 of the POEO Act 1997 states that if waste is transported to a place that cannot lawfully be used as a waste facility for that waste, then the transporter and owner of the waste are each guilty of an offence. The transporter and owner of the waste have a duty to ensure that the waste is disposed of in an appropriate manner.

Guideline / Legislation / Policy	Applicability
	Activities should be carried out in a manner which does not result in the pollution of waters.
POEO (Waste) Regulation 2014	Part 7 of the POEO Waste Regulation 2014 set outs the requirements for the transportation and management of asbestos waste and Clause 79 of the POEO Waste Regulation requires waste transporters to provide information to the NSW EPA regarding the movement of any load in NSW of more than 10 square meters of asbestos sheeting, or 100 kilograms of asbestos waste. To fulfil these legal obligations, asbestos waste transporters must use the NSW EPA-endorsed tracking system. All waste must be disposed of lawfully to licensed facilities, in accordance with the waste classification documentation applicable to the project.
Work Health and Safety Regulation (2017) **SafeWork NSW Code of Practice: How to manage and control asbestos in the workplace (2019)**	Sites with asbestos become a 'workplace' when work is carried out there and require a register and AMP. Appropriate SafeWork NSW notification will be required for licensed (Class A) asbestos removal works or handling. Reference is to be made to the construction-phase AMP for further details regarding the regulatory requirements for managing asbestos during remediation. The LTEMP/AMP will detail management for the potential asbestos contamination at the site.
NSW EPA Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997	The requirement to notify the EPA should be assessed as part of the site validation process.

11 LIMITATIONS

The report limitations are outlined below:

- JKE accepts no responsibility for any unidentified contamination issues at the site. Any unexpected problems/subsurface features that may be encountered during development works should be inspected by an environmental consultant as soon as possible;
- Previous use of this site may have involved excavation for the foundations of buildings, services, and similar facilities. In addition, unrecorded excavation and burial of material may have occurred on the site. Backfilling of excavations could have been undertaken with potentially contaminated material that may be discovered in discrete, isolated locations across the site during construction work;
- This report has been prepared based on site conditions which existed at the time of the investigation; scope of work and limitation outlined in the JKE proposal; and terms of contract between JKE and the client (as applicable);
- The conclusions presented in this report are based on investigation of conditions at specific locations, chosen to be as representative as possible under the given circumstances, visual observations of the site and immediate surrounds and documents reviewed as described in the report;
- Subsurface soil and rock conditions encountered between investigation locations may be found to be different from those expected. Groundwater conditions may also vary, especially after climatic changes;
- The investigation and preparation of this report have been undertaken in accordance with accepted practice for environmental consultants, with reference to applicable environmental regulatory authority and industry standards, guidelines and the assessment criteria outlined in the report;
- Where information has been provided by third parties, JKE has not undertaken any verification process, except where specifically stated in the report;
- JKE has not undertaken any assessment of off-site areas that may be potential contamination sources or may have been impacted by site contamination, except where specifically stated in the report;
- JKE accept no responsibility for potentially asbestos containing materials that may exist at the site. These materials may be associated with demolition of pre-1990 constructed buildings or fill material at the site;
- JKE have not and will not make any determination regarding finances associated with the site;
- Additional investigation work may be required in the event of changes to the proposed development or landuse. JKE should be contacted immediately in such circumstances;
- Material considered to be suitable from a geotechnical point of view may be unsatisfactory from a soil contamination viewpoint, and vice versa; and
- This report has been prepared for the particular project described and no responsibility is accepted for the use of any part of this report in any other context or for any other purpose.

Important Information About This Report

These notes have been prepared by JKE to assist with the assessment and interpretation of this report.

The Report is based on a Unique Set of Project Specific Factors
This report has been prepared in response to specific project requirements as stated in the JKE proposal document which may have been limited by instructions from the client. This report should be reviewed, and if necessary, revised if any of the following occur:

- The proposed land use is altered;
- The defined subject site is increased or sub-divided;
- The proposed development details including size, configuration, location, orientation of the structures or landscaped areas are modified;
- The proposed development levels are altered, eg addition of lower ground level levels; or
- Ownership of the site changes.

JKE will not accept any responsibility whatsoever for situations where one or more of the above factors have changed since completion of the assessment. If the subject site is sold, ownership of the assessment report should be transferred by JKE to the new site owners who will be informed of the conditions and limitations under which the assessment was undertaken. No person should apply an assessment for any purpose other than that originally intended without first conferring with the consultant.

Changes in Subsurface Conditions
Subsurface conditions are influenced by natural geological and hydrogeological process and human activities. Groundwater conditions are likely to vary over time with changes in climatic conditions and human activities within the catchment (e.g. water extraction for irrigation or industrial uses, subsurface waste water disposal, construction related dewatering). Soil and groundwater contaminant concentrations may also vary over time through contaminant migration, natural attenuation of organic contaminants, ongoing contaminating activities and placement or removal of fill material. The conclusions of an assessment report may have been affected by the above factors if a significant period of time has elapsed prior to commencement of the proposed development.

This Report is based on Professional Interpretations of Factual Data
Site assessments identify actual subsurface conditions at the actual sampling locations at the time of the investigation. Data obtained from the sampling and subsequent laboratory analyses, available site history information and published regional information is interpreted by geologists, engineers or environmental scientists and opinions are drawn about the overall subsurface conditions, the nature and extent of contamination, the likely impact on the proposed development and appropriate remediation measures.

Actual conditions may differ from those inferred, because no professional, no matter how qualified, and no subsurface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than an assessment indicates. Actual conditions in areas not sampled may differ from predictions. Nothing can be done to prevent the unanticipated, but steps can be taken to help minimise the impact. For this reason, site owners should retain the services of their consultants throughout the development stage of the project, to identify variances, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site.

Assessment Limitations
Although information provided by a site assessment can reduce exposure to the risk of the presence of contamination, no environmental site assessment can eliminate the risk. Even a rigorous professional assessment may not detect all contamination on a site. Contaminants may be present in areas that were not surveyed or sampled, or may migrate to areas which showed no signs of contamination when sampled. Contaminant analysis cannot possibly cover every type of contaminant which may occur; only the most likely contaminants are screened.

Misinterpretation of Site Assessments by Design Professionals

Costly problems can occur when other design professionals develop plans based on misinterpretation of an assessment report. To minimise problems associated with misinterpretations, the environmental consultant should be retained to work with appropriate professionals to explain relevant findings and to review the adequacy of plans and specifications relevant to contamination issues.

Logs Should not be Separated from the Assessment Report

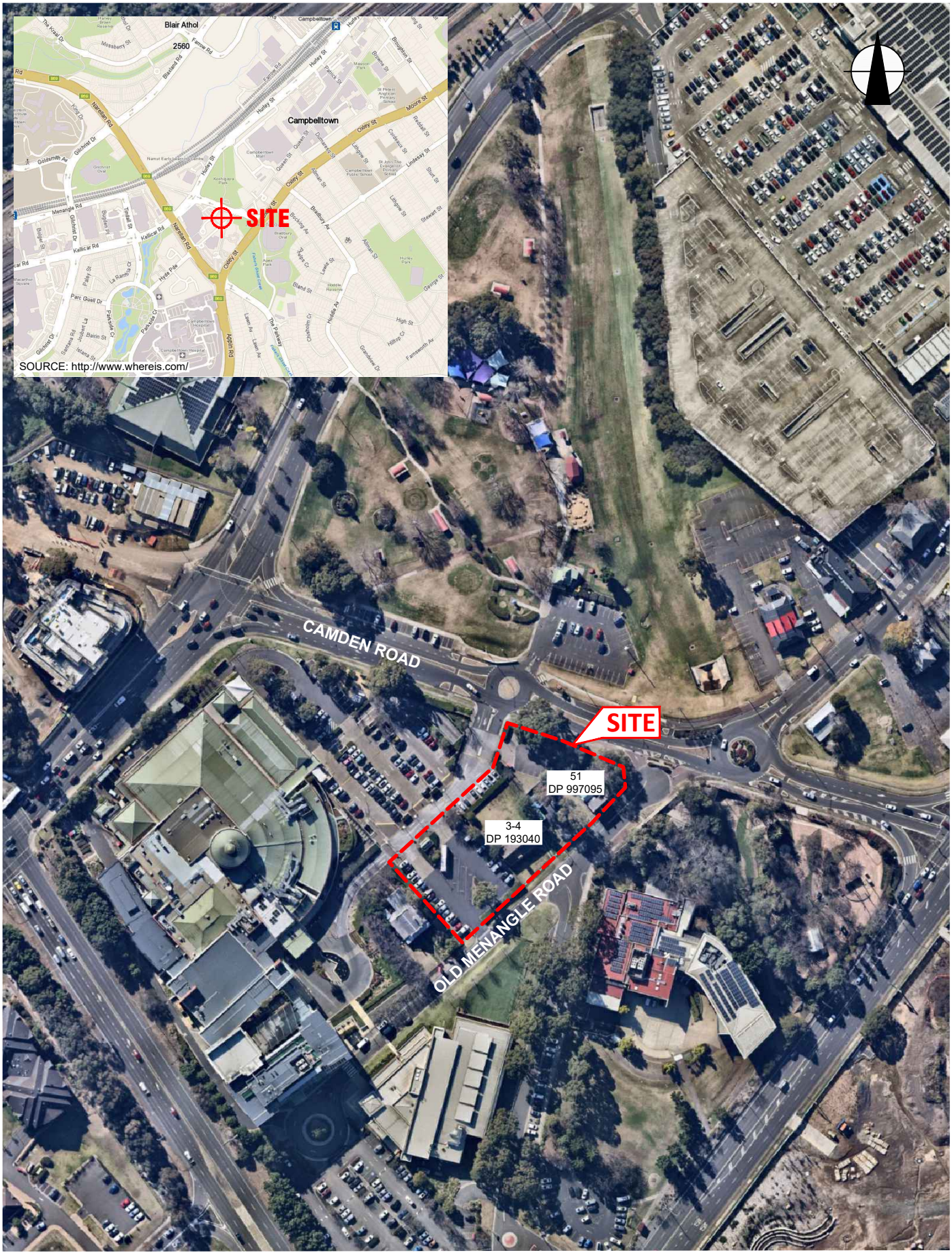
Borehole and test pit logs are prepared by environmental scientists, engineers or geologists based upon interpretation of field conditions and laboratory evaluation of field samples. Logs are normally provided in our reports and these should not be re-drawn for inclusion in site remediation or other design drawings, as subtle but significant drafting errors or omissions may occur in the transfer process. Photographic reproduction can eliminate this problem, however contractors can still misinterpret the logs during bid preparation if separated from the text of the assessment. If this occurs, delays, disputes and unanticipated costs may result. In all cases it is necessary to refer to the rest of the report to obtain a proper understanding of the assessment. Please note that logs with the 'Environmental Log' header are not suitable for geotechnical purposes as they have not been peer reviewed by a Senior Geotechnical Engineer.

To reduce the likelihood of borehole and test pit log misinterpretation, the complete assessment should be available to persons or organisations involved in the project, such as contractors, for their use. Denial of such access and disclaiming responsibility for the accuracy of subsurface information does not insulate an owner from the attendant liability. It is critical that the site owner provides all available site information to persons and organisations such as contractors.

Read Responsibility Clauses Closely

Because an environmental site assessment is based extensively on judgement and opinion, it is necessarily less exact than other disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, model clauses have been developed for use in written transmittals. These are definitive clauses designed to indicate consultant responsibility. Their use helps all parties involved recognise individual responsibilities and formulate appropriate action. Some of these definitive clauses are likely to appear in the environmental site assessment, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to any questions.

Appendix A: Report Figures



AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM

This plan should be read in conjunction with the Environmental report.

Title: **SITE LOCATION PLAN**

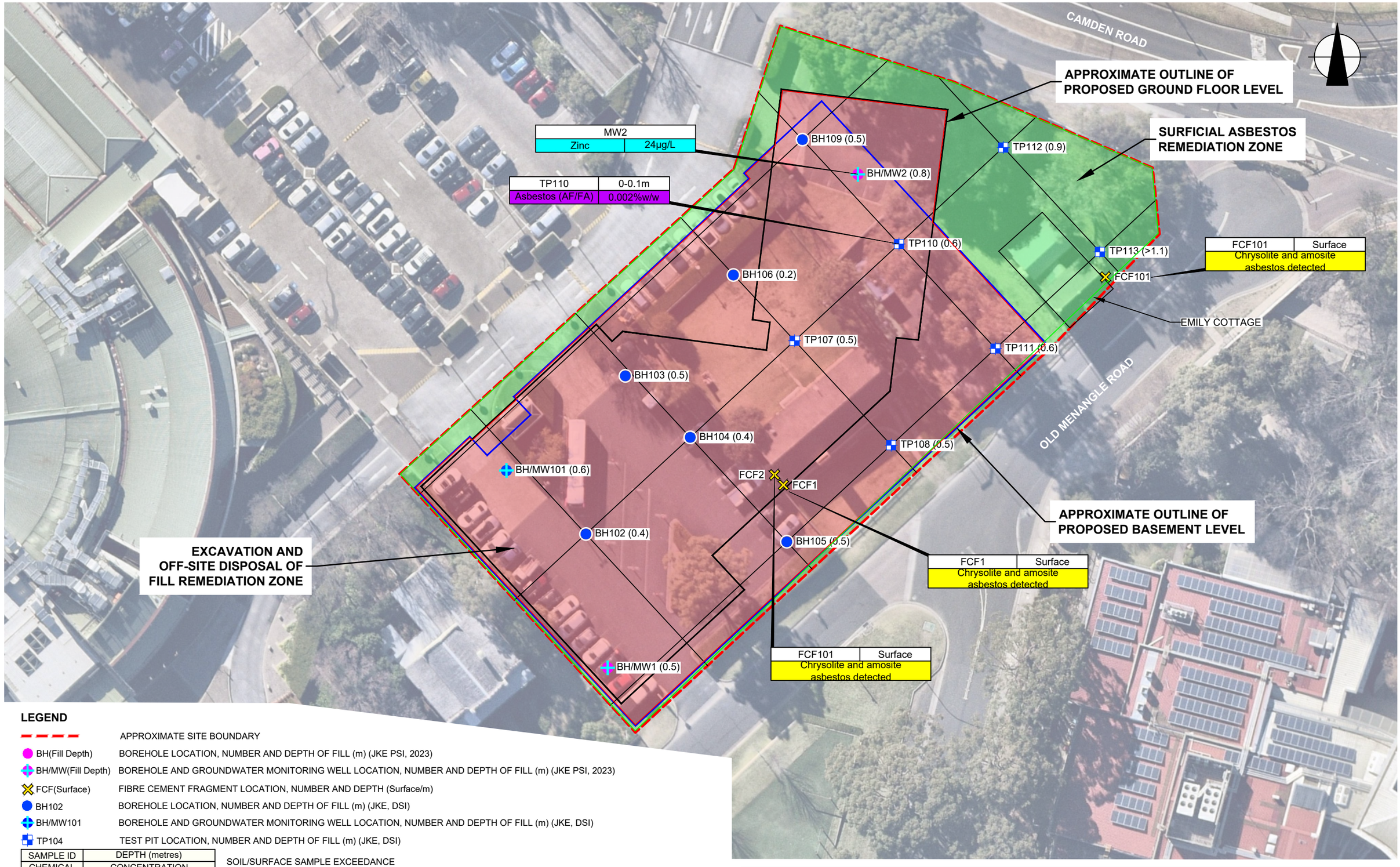
Location: 3 OLD MENANGLE ROAD, CAMPBELLTOWN, NSW

Project No: E36287BL

Figure No: 1

JKEnvironments

PLOT DATE: 16/11/2023 1:32:55 PM DWG FILE: K:\SC EIS \JOBS\36000\SIE36287BL CAMPBELLTOWN\CAD\E36287BL.DWG



LEGEND

APPROXIMATE SITE BOUNDARY	
BH(Fill Depth)	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE PSI, 2023)
BH/MW(Fill Depth)	BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE PSI, 2023)
FCF(Surface)	FIBRE CEMENT FRAGMENT LOCATION, NUMBER AND DEPTH (Surface/m)
BH102	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, DSI)
BH/MW101	BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, DSI)
TP104	TEST PIT LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, DSI)

SAMPLE ID	DEPTH (metres)
CHEMICAL	CONCENTRATION

SOIL/SURFACE SAMPLE EXCEEDANCE

SAMPLE ID	-
CHEMICAL	CONCENTRATION (µg/L)

GROUNDWATER SAMPLE EXCEEDANCE

SOIL/SURFACE CONTAMINATION ABOVE SAC

ASBESTOS DETECTED

GROUNDWATER CONTAMINATION ABOVE SAC

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM

0 5 10 15 20 25

SCALE 1:500 @A3 METRES

This plan should be read in conjunction with the Environmental report.

Title: **SITE REMEDIATION PLAN**

Location: 3 OLD MENANGLE ROAD, CAMPBELLTOWN, NSW

Project No: E36287BL

Figure No: 2

JKEnvironments

PLOT DATE: 13/08/2024 11:08:54 AM DWG FILE: K:\5C EIS JOBS\36000'S\E36287BL CAMPBELLTOWN\CADE36287BL.DWG

Appendix B: Proposed Development Plans

[Status] Preliminary

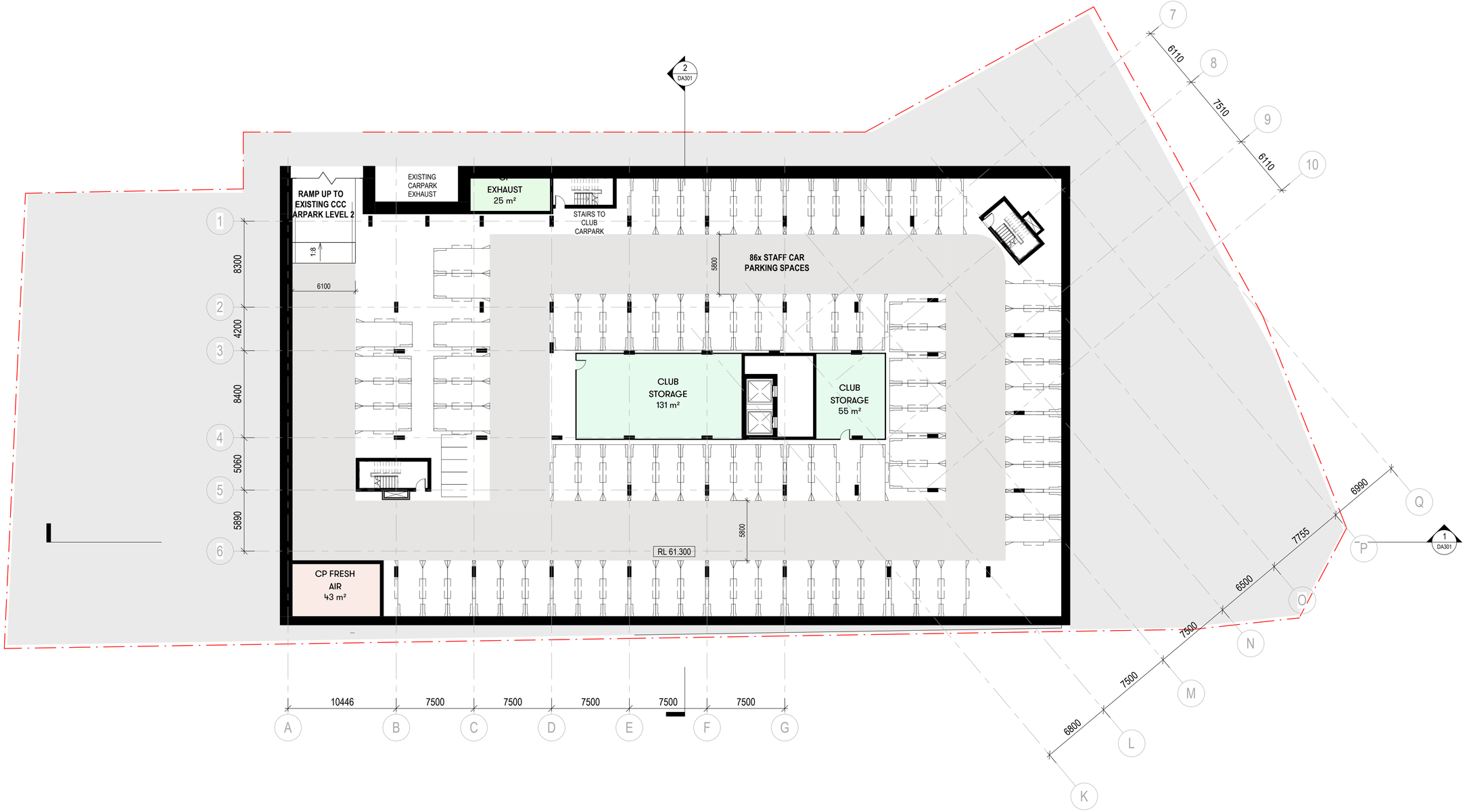
Doug Southwell /7362

[File] 20220099-AB-DA001.rvt

[Print Date] 24/11/2023 6:05:14 PM

History

[Rev#]	[Description]	[Date]
A	PRELIMINARY	17.08.2023
B	FOR INFORMATION	18.10.2023
C	FOR INFORMATION	10.11.2023
D	FOR INFORMATION	24.11.2023



scott carver
Level One, One Chifley Square Sydney NSW 2000 Australia
www.scottcarver.com.au +61 2 9957 3988

[Project] CAMPBELLTOWN CATHOLIC CLUB INDEPENDENT LIVING

[Client] Campbelltown Catholic Club

0 2 4 6 8 10 m
Bar Scale 1:200

[Scale] 1 : 200 @ A1

GA PLAN - BASEMENT 3

[Ref] 20220099 [Dwg No] AD-DA097 [Rev] D

[Status] Preliminary

Doug Southwell /7362

[File] 20220099-AB-DA001.rvt

[Print Date] 24/11/2023 5:59:43 PM

History

[Rev#]	[Description]	[Date]
A	PRELIMINARY	17.08.2023
B	FOR INFORMATION	18.10.2023
C	FOR INFORMATION	10.11.2023
D	FOR INFORMATION	24.11.2023

scott carver
Level One, One Chifley Square Sydney NSW 2000 Australia
www.scottcarver.com.au +61 2 9957 3988

[Project] CAMPBELLTOWN CATHOLIC CLUB INDEPENDENT LIVING

[Client] Campbelltown Catholic Club

0 2 4 6 8 10 m
Bar Scale 1:200

[Scale] 1 : 200 @ A1

GA PLAN - BASEMENT 2

[Ref] 20220099 [Dwg No] AD-DA098 [Rev] D

[Status] Preliminary

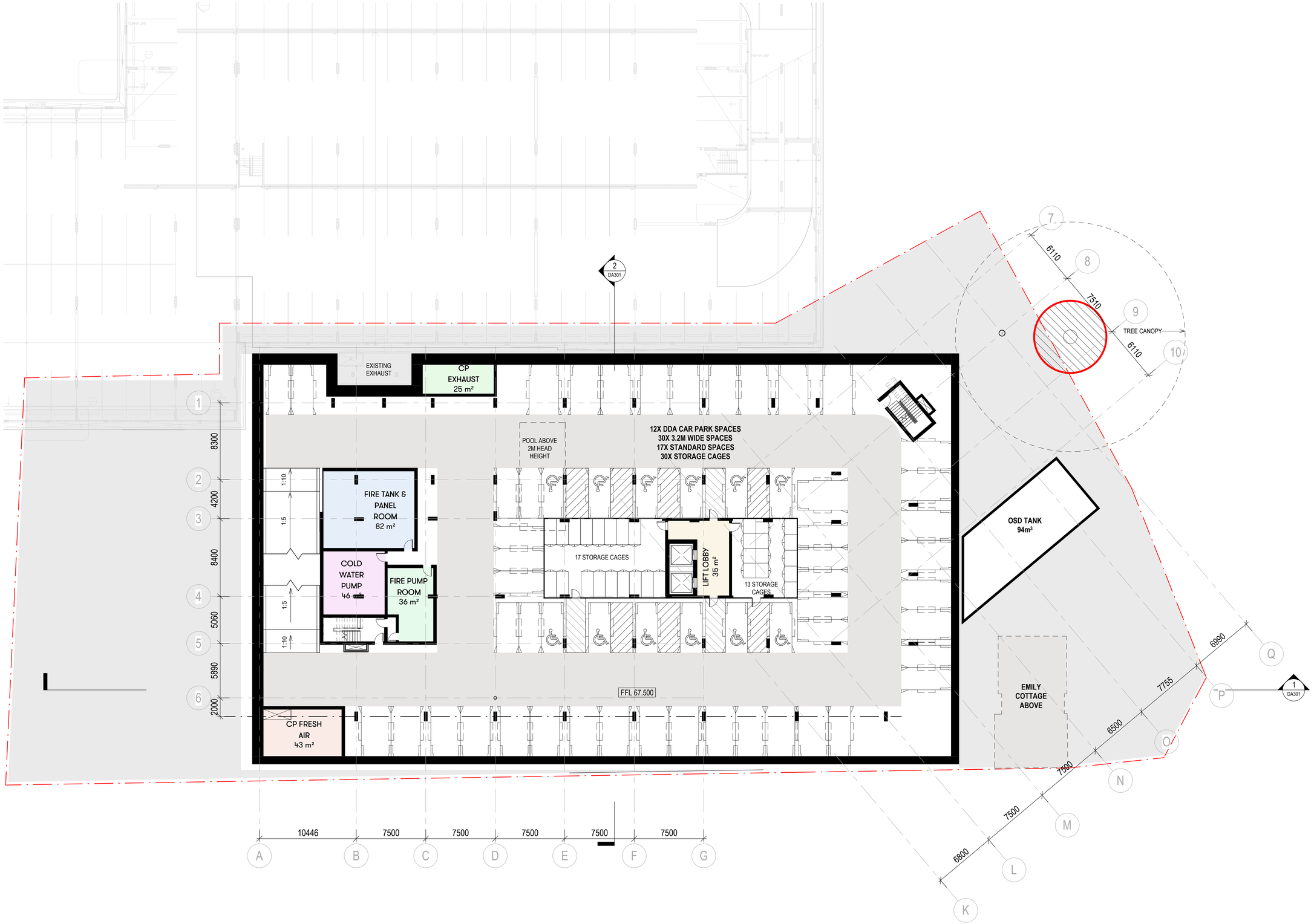
Doug Southwell /7362

[File] 20220099-AB-DA001.rvt

[Print Date] 24/11/2023 5:59:45 PM

History

[Rev#]	[Description]	[Date]
A	PRELIMINARY	17.08.2023
B	FOR INFORMATION	18.10.2023
C	FOR INFORMATION	10.11.2023
D	FOR INFORMATION	24.11.2023



scott carver
Level One, One Chifley Square Sydney NSW 2000 Australia
www.scottcarver.com.au +61 2 9957 3988

[Project] CAMPBELLTOWN CATHOLIC CLUB INDEPENDENT LIVING

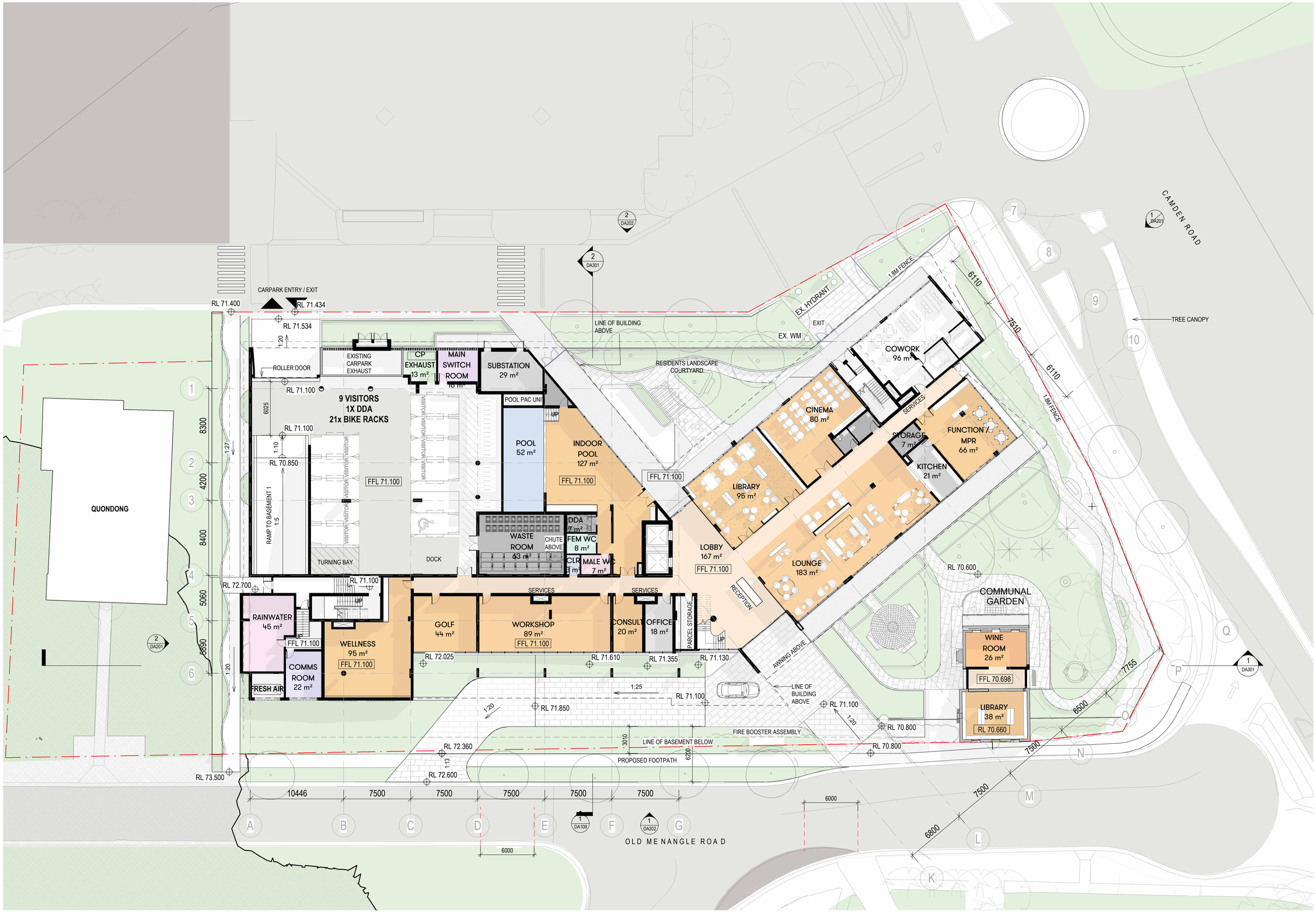
[Client] Campbelltown Catholic Club

0 2 4 6 8 10 m
Bar Scale 1:200

[Scale] 1 : 200 @ A1

GA PLAN - BASEMENT 1

[Ref] 20220099 [Dwg No] AD-DA099 [Rev] D



[Status] Preliminary

Doug Southwell /7362

[File] 20220099-AB-DA001.rvt

[Print Date] 24/11/2023 6:00:27 PM

History

[Rev#]	[Description]	[Date]
A	PRELIMINARY	17.08.2023
B	FOR INFORMATION	18.10.2023
C	FOR INFORMATION	10.11.2023
D	FOR INFORMATION	24.11.2023

scott carver
Level One, One Chifley Square Sydney NSW 2000 Australia
www.scottcarver.com.au +61 2 9957 3988

[Project] CAMPBELLTOWN CATHOLIC CLUB INDEPENDENT LIVING

[Client] Campbelltown Catholic Club

Bar Scale 1:200 (0 2 4 6 8 10 m)

[Scale] 1 : 200 @ A1

GA PLAN - GROUND FLOOR

[Ref] 20220099 [Dwg No] AD-DA100 [Rev] D

[Status] Preliminary

Doug Southwell /7362

[File] 20220099-AB-DA001.rvt

[Print Date] 24/11/2023 6:00:35 PM

History

[Rev#]	[Description]	[Date]
A	PRELIMINARY	17.08.2023
B	FOR INFORMATION	18.10.2023
C	FOR INFORMATION	10.11.2023
D	FOR INFORMATION	24.11.2023

scott carver
Level One, One Chifley Square Sydney NSW 2000 Australia
www.scottcarver.com.au +61 2 9957 3988

[Project] CAMPBELLTOWN CATHOLIC CLUB INDEPENDENT LIVING

[Client] Campbelltown Catholic Club

Bar Scale 1:200 (0 2 4 6 8 10 m)

[Scale] 1 : 200 @ A1

GA PLAN - LEVEL 1

[Ref] 20220099 [Dwg No] AD-DA101 [Rev] D

[Status] Preliminary

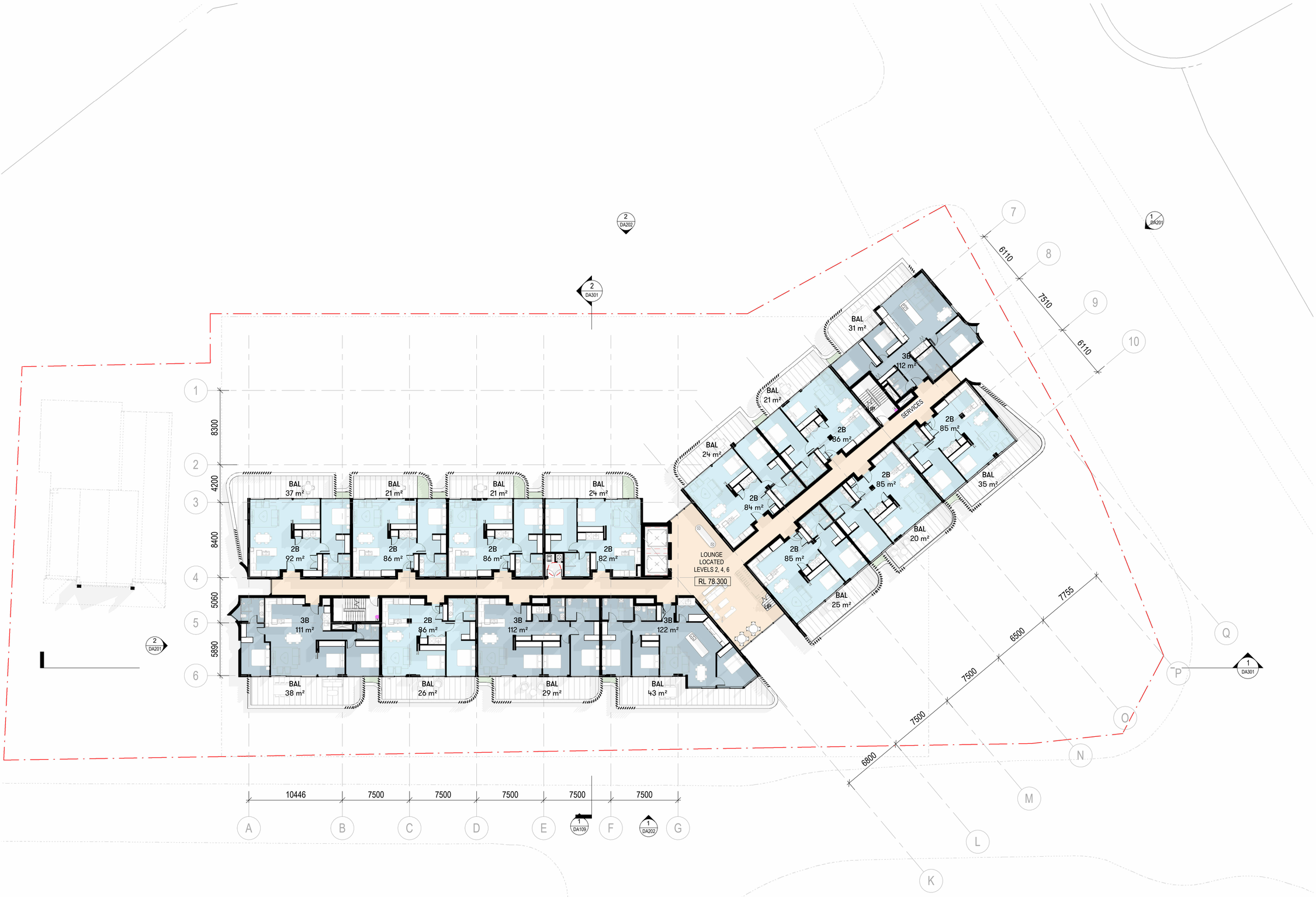
Doug Southwell /7362

[File] 20220099-AB-DA001.rvt

[Print Date] 24/11/2023 6:00:43 PM

History

[Rev#]	[Description]	[Date]
A	PRELIMINARY	17.08.2023
B	FOR INFORMATION	18.10.2023
C	FOR INFORMATION	10.11.2023
D	FOR INFORMATION	24.11.2023



scott carver
Level One, One Chifley Square Sydney NSW 2000 Australia
www.scottcarver.com.au +61 2 9957 3988

[Project] CAMPBELLTOWN CATHOLIC CLUB INDEPENDENT LIVING

[Client] Campbelltown Catholic Club

0 2 4 6 8 10 m
Bar Scale 1:200

[Scale] 1 : 200 @ A1

GA PLAN - LEVEL 2, 4 & 6

[Ref] 20220099 [Dwg No] AD-DA102 [Rev] D

[Status] Preliminary

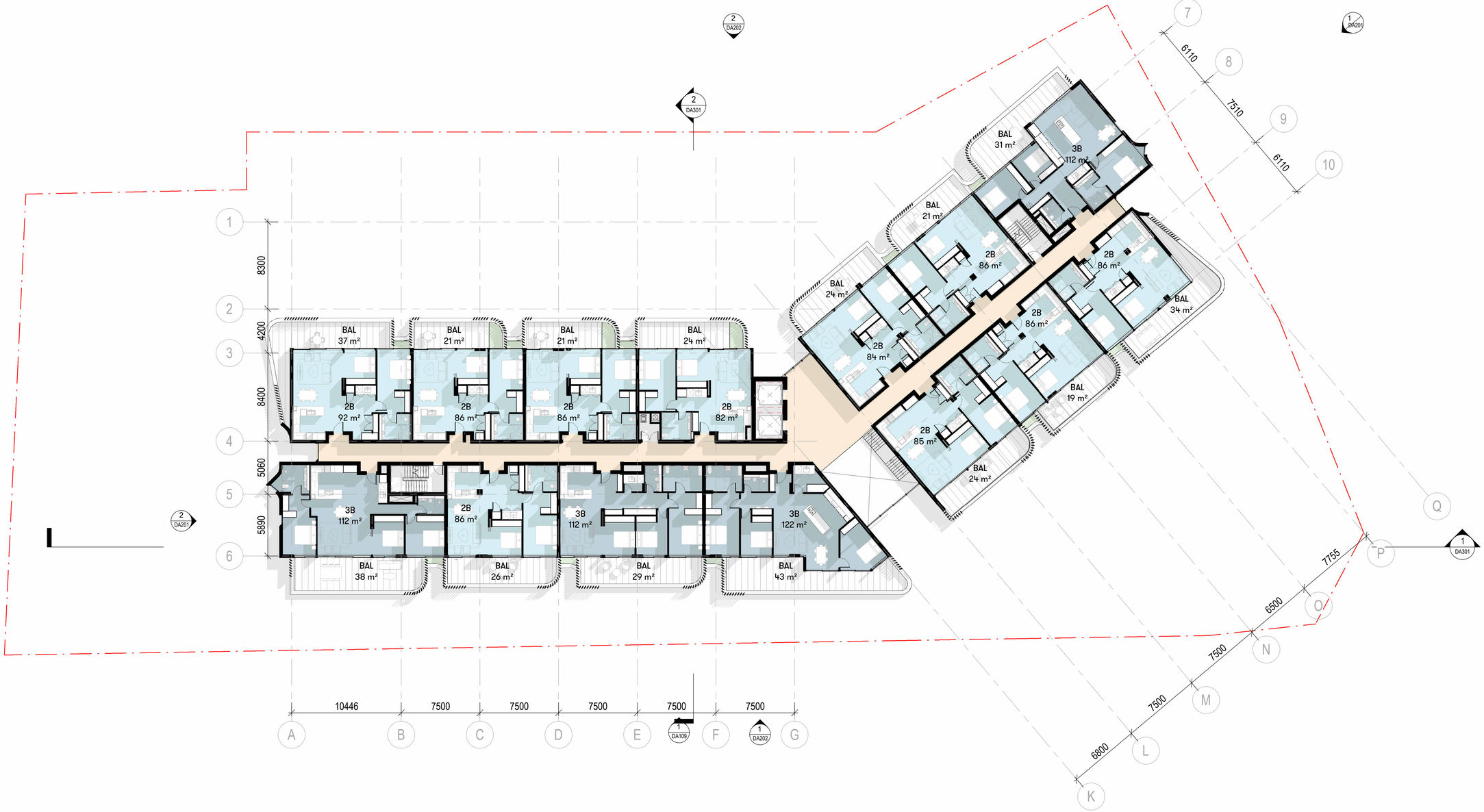
Doug Southwell /7362

[File] 20220099-AB-DA001.rvt

[Print Date] 24/11/2023 6:00:50 PM

History

[Rev#]	[Description]	[Date]
A	FOR INFORMATION	10.11.2023
B	FOR INFORMATION	24.11.2023



scott carver

Level One, One Chifley Square Sydney NSW 2000 Australia
www.scottcarver.com.au +61 2 9957 3988

[Project] CAMPBELLTOWN CATHOLIC CLUB INDEPENDENT LIVING

[Client] Campbelltown Catholic Club

0 2 4 6 8 10 m
Bar Scale 1:200

[Scale] 1 : 200 @ A1

GA PLAN - LEVEL 3 & 5

[Ref] 20220099 [Dwg No] AD-DA103 [Rev] B

[Status] Preliminary

Doug Southwell /7362

[File] 20220099-AB-DA001.rvt

[Print Date] 24/11/2023 6:00:57 PM

History

[Rev#]	[Description]	[Date]
A	PRELIMINARY	17.08.2023
B	FOR INFORMATION	18.10.2023
C	FOR INFORMATION	10.11.2023
D	FOR INFORMATION	24.11.2023

scott carver

Level One, One Chifley Square Sydney NSW 2000 Australia
www.scottcarver.com.au +61 2 9957 3988

[Project] CAMPBELLTOWN CATHOLIC CLUB INDEPENDENT LIVING

[Client] Campbelltown Catholic Club

0 2 4 6 8 10 m
Bar Scale 1:200

[Scale] 1 : 200 @ A1

GA PLAN - LEVEL 7

[Ref] 20220099 [Dwg No] AD-DA107 [Rev] D

[Status] Preliminary

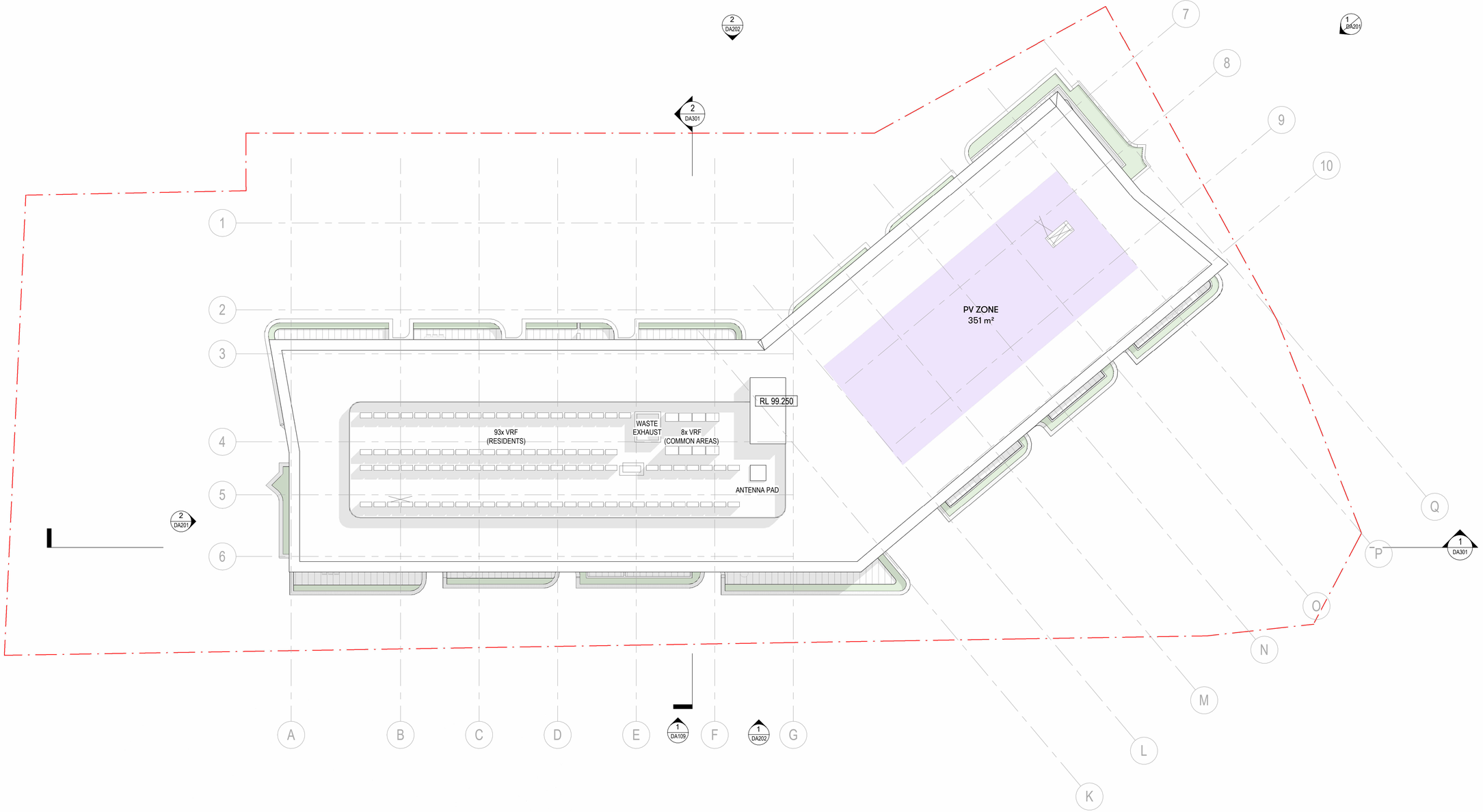
Doug Southwell /7362

[File] 20220099-AB-DA001.rvt

[Print Date] 24/11/2023 6:01:10 PM

History

[Rev#]	[Description]	[Date]
A	FOR INFORMATION	24.11.2023



scott carver
Level One, One Chifley Square Sydney NSW 2000 Australia
www.scottcarver.com.au +61 2 9957 3988

[Project] CAMPBELLTOWN CATHOLIC CLUB INDEPENDENT LIVING

[Client] Campbelltown Catholic Club

0 2 4 6 8 10 m
Bar Scale 1:200

[Scale] 1 : 200 @ A1

GA PLAN - ROOF LEVEL

[Ref] 20220099 [Dwg No] AD-DA108 [Rev] A

Appendix C: DSI Summary Data Tables

ABBREVIATIONS AND EXPLANATIONS

Abbreviations used in the Tables:

ABC: Ambient Background Concentration
ACM: Asbestos Containing Material
AF: Asbestos Fines
ANZG Australian and New Zealand Guidelines
B(a)P: Benzo(a)pyrene
CEC: Cation Exchange Capacity
CRC: Cooperative Research Centre
CT: Contaminant Threshold
EILs: Ecological Investigation Levels
ESLs: Ecological Screening Levels
FA: Fibrous Asbestos
GSW: General Solid Waste
HILs: Health Investigation Levels
HSLs: Health Screening Levels
kg/L kilograms per litre
NA: Not Analysed
NC: Not Calculated
NEPM: National Environmental Protection Measure
NHMRC: National Health and Medical Research Council
NL: Not Limiting
NSL: No Set Limit
OCP: Organochlorine Pesticides
OPP: Organophosphorus Pesticides
PAHs: Polycyclic Aromatic Hydrocarbons
%w/w: weight per weight
PCBs: Polychlorinated Biphenyls
PCE: Perchloroethylene (Tetrachloroethylene or Teterachloroethene)
PQL: Practical Quantitation Limit
RS: Rinsate Sample
RSL: Regional Screening Levels
RSW: Restricted Solid Waste
SAC: Site Assessment Criteria
SCC: Specific Contaminant Concentration
TB: Trip Blank
TCA: 1,1,1 Trichloroethane (methyl chloroform)
TCE: Trichloroethylene (Trichloroethene)
TCLP: Toxicity Characteristics Leaching Procedure
TS: Trip Spike
TRH: Total Recoverable Hydrocarbons
UCL: Upper Level Confidence Limit on Mean Value
USEPA United States Environmental Protection Agency
VOCC: Volatile Organic Chlorinated Compounds
WHO: World Health Organisation

Table Specific Explanations:

HIL Tables:

- The chromium results are for Total Chromium which includes Chromium III and VI. For initial screening purposes, we have assumed that the samples contain only Chromium VI unless demonstrated otherwise by additional analysis.
- Carcinogenic PAHs is a toxicity weighted sum of analyte concentrations for a specific list of PAH compounds relative to B(a)P. It is also refered to as the B(a)P Toxic Equivalence Quotient (TEQ).
- Statistical calculations are undertaken using ProUCL (USEPA). Statistical calculation is usually undertaken using data from fill samples.

EIL/ESL Table:

Site specific ABC values for specific metals have been adopted.

Waste Classification and TCLP Table:

- Data assessed using the NSW EPA Waste Classification Guidelines, Part 1: Classifying Waste (2014).
- The assessment of Total Moderately Harmful pesticides includes: Dichlorovos, Dimethoate, Fenitrothion, Ethion, Malathion and Parathion.
- Assessment of Total Scheduled pesticides include: HBC, alpha-BHC, gamma-BHC, beta-BHC, Heptachlor, Aldrin, Heptachlor Epoxide, gamma-Chlordane, alpha-chlordane, pp-DDE, Dieldrin, Endrin, pp-DDD, pp-DDT, Endrin Aldehyde.

QA/QC Table:

- Field blank, Inter and Intra laboratory duplicate results are reported in mg/kg.
- Trip spike results are reported as percentage recovery.
- Field rinsate results are reported in µg/L.

TABLE S1
SOIL LABORATORY RESULTS COMPARED TO NEPM 2013.
HIL-B: 'Residential with minimal opportunities for soil access; including dwellings with fully/permanently paved yards like high-rise buildings'

All data in mg/kg unless stated otherwise			HEAVY METALS								PAHs		ORGANOCHLORINE PESTICIDES (OCPs)							OP PESTICIDES (OPPs)	TOTAL PCBs	ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	Carcinogenic PAHs	HCB	Endosulfan	Methoxychlor	Aldrin & Dieldrin	Chlordane	DDT, DDD & DDE	Heptachlor	Chlorpyrifos		
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	100
Site Assessment Criteria (SAC)			500	150	500	30000	1200	120	1200	60000	400	4	15	400	500	10	90	600	10	340	1	Detected/Not Detected
Sample Reference	**Sample Depth**	**Sample Description**																				
BH101	0.16-0.3	F: Silty sand	<4	<0.4	**9**	**93**	<1	<0.1	**52**	**36**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH101 - [LAB_DUP]	0.16-0.3	F: Silty sand	<4	<0.4	**8**	**69**	<1	<0.1	**42**	**30**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH102	0.05-0.25	F: Silty sand	<4	<0.4	**4**	<1	**1**	<0.1	<1	<1	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH102	0.5-0.8	Silty clay	<4	<0.4	**8**	**28**	**15**	<0.1	**6**	**24**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH103	0.05-0.2	F: Silty sand	<4	<0.4	**9**	<1	<1	<0.1	<1	<1	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH104	0.05-0.2	F: Silty sand	<4	<0.4	**5**	**5**	<1	<0.1	**6**	**4**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH105	0.05-0.2	F: Silty sand	<4	<0.4	**10**	**15**	**9**	<0.1	**9**	**17**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH106	0-0.1	F: Silty clay	**7**	<0.4	**19**	**34**	**100**	<0.1	**11**	**180**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
TP107	0-0.1	F: Silty clay	**11**	**0.7**	**23**	**69**	**110**	<0.1	**11**	**160**	**0.2**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
TP107	0.9-1.1	Silty clay	**8**	<0.4	**18**	**33**	**27**	<0.1	**13**	**58**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP108	0-0.1	F: Silty clay	**7**	<0.4	**13**	**26**	**110**	**0.1**	**9**	**120**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
TP108	0.4-0.5	F: Silty clay	**8**	<0.4	**19**	**26**	**77**	**0.1**	**12**	**88**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH109	0.03-0.2	F: Silty sand	<4	<0.4	**66**	**27**	**4**	<0.1	**70**	**40**	**0.3**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH109	0.5-0.95	Silty clay	**5**	<0.4	**13**	**33**	**18**	<0.1	**9**	**40**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP110	0-0.1	F: Silty clay	**5**	**0.4**	**14**	**32**	**110**	<0.1	**14**	**120**	**2.6**	**0.6**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Detected
TP110	1.0-1.1	Silty clay	**5**	<0.4	**14**	**34**	**19**	<0.1	**8**	**41**	**0.09**	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP111	0-0.1	F: Silty sandy clay	<4	<0.4	**34**	**12**	**28**	<0.1	**6**	**25**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
TP111 - [LAB_DUP]	0-0.1	F: Silty sandy clay	<4	<0.4	**10**	**18**	**34**	<0.1	**9**	**41**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
TP111 - [TRIPLICATE]	0-0.1	F: Silty sandy clay	<4	<0.4	**8**	**65**	<1	<0.1	**42**	**30**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP112	0-0.1	F: Silty clay	**7**	<0.4	**17**	**58**	**180**	**0.1**	**16**	**180**	**3.8**	**0.8**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
TP112	1.3-1.4	Silty clay	**5**	<0.4	**14**	**29**	**20**	<0.1	**8**	**43**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP113	0-0.1	F: Silty clay	**8**	<0.4	**20**	**59**	**460**	**0.4**	**15**	**310**	**2.2**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
TP113	0.7-0.8	F: Silty clay	**6**	<0.4	**15**	**33**	**93**	**0.1**	**10**	**81**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SDUP101	-	F: Silty clay	**5**	<0.4	**10**	**20**	**73**	<0.1	**7**	**78**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP102	-	F: Silty sand	<4	<0.4	**8**	**79**	<1	<0.1	**46**	**31**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
FCF101	-	Material	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Detected
Total Number of Samples			25	25	25	25	25	25	25	25	24	24	18	18	18	18	18	18	18	18	18	15
Maximum Value			11	0.7	66	93	460	0.4	70	310	3.8	0.8	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	Detected

Concentration above the SAC — **VALUE**
Concentration above the PQL — **Bold**
Asbestos Detected — **Detected**

TABLE S2
SOIL LABORATORY RESULTS COMPARED TO HSLs
All data in mg/kg unless stated otherwise

					C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	Field PID Measurement
PQL - Envirolab Services					25	50	0.2	0.5	1	1	1	ppm
NEPM 2013 HSL Land Use Category					HSL-A/B: LOW/HIGH DENSITY RESIDENTIAL							
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**								
BH101	0.16-0.3	F: Silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH101 - [LAB_DUP]	0.16-0.3	F: Silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	-
BH102	0.05-0.25	F: Silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.3
BH102	0.5-0.8	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH103	0.05-0.2	F: Silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH104	0.05-0.2	F: Silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.2
BH105	0.05-0.2	F: Silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.3
BH106	0-0.1	F: Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.2
TP107	0-0.1	F: Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.2
TP107	0.9-1.1	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
TP108	0-0.1	F: Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	
TP108	0.4-0.5	F: Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.2
BH109	0.03-0.2	F: Silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.3
BH109	0.5-0.95	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.5
TP110	0-0.1	F: Silty clay	0m to <1m	Sand	<25	**74**	<0.2	<0.5	<1	<1	<1	0.2
TP110	1.0-1.1	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.4
TP111	0-0.1	F: Silty sandy clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.3
TP111 - [LAB_DUP]	0-0.1	F: Silty sandy clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	-
TP112	0-0.1	F: Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
TP112	1.3-1.4	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.2
TP113	0-0.1	F: Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.4
TP113	0.7-0.8	F: Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.5
SDUP101	-	F: Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	-
SDUP102	-	F: Silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	-
Total Number of Samples					24	24	24	24	24	24	24	19
Maximum Value					<PQL	74	<PQL	<PQL	<PQL	<PQL	<PQL	0.5

Concentration above the SAC **VALUE**
Concentration above the PQL **Bold**
The guideline corresponding to the concentration above the SAC is highlighted in grey in the Site Assessment Criteria Table below

HSL SOIL ASSESSMENT CRITERIA

Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
BH101	0.16-0.3	F: Silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH101 - [LAB_DUP]	0.16-0.3	F: Silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH102	0.05-0.25	Fill: Silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH102	0.5-0.8	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH103	0.05-0.2	F: Silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH104	0.05-0.2	Fill: Silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH105	0.05-0.2	F: Silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH106	0-0.1	F: Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP107	0-0.1	F: Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP107	0.9-1.1	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP108	0-0.1	F: Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP108	0.4-0.5	F: Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH109	0.03-0.2	F: Silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH109	0.5-0.95	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP110	0-0.1	F: Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP110	1.0-1.1	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP111	0-0.1	F: Silty sandy clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP111 - [LAB_DUP]	0-0.1	F: Silty sandy clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP112	0-0.1	F: Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP112	1.3-1.4	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP113	0-0.1	F: Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP113	0.7-0.8	F: Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP101	-	F: Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP102	-	F: Silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3

TABLE S3
SOIL LABORATORY RESULTS COMPARED TO MANAGEMENT LIMITS
All data in mg/kg unless stated otherwise

			C_6-C_{10} (F1) plus BTEX	>C_{10}-C_{16} (F2) plus napthalene	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)
PQL - Envirolab Services			25	50	100	100
NEPM 2013 Land Use Category			**RESIDENTIAL, PARKLAND & PUBLIC OPEN SPACE**			
Sample Reference	**Sample Depth**	**Soil Texture**				
BH101	0.16-0.3	Coarse	<25	<50	<100	<100
BH101 - [LAB_DUP]	0.16-0.3	Coarse	<25	<50	<100	<100
BH102	0.05-0.25	Coarse	<25	<50	<100	<100
BH102	0.5-0.8	Coarse	<25	<50	<100	<100
BH103	0.05-0.2	Coarse	<25	<50	<100	<100
BH104	0.05-0.2	Coarse	<25	<50	<100	<100
BH105	0.05-0.2	Coarse	<25	<50	<100	<100
BH106	0-0.1	Coarse	<25	<50	<100	<100
TP107	0-0.1	Coarse	<25	<50	<100	<100
TP107	0.9-1.1	Coarse	<25	<50	<100	<100
TP108	0-0.1	Coarse	<25	<50	<100	<100
TP108	0.4-0.5	Coarse	<25	<50	<100	<100
BH109	0.03-0.2	Coarse	<25	<50	<100	<100
BH109	0.5-0.95	Coarse	<25	<50	<100	<100
TP110	0-0.1	Coarse	<25	**74**	**280**	<100
TP110	1.0-1.1	Coarse	<25	<50	<100	<100
TP111	0-0.1	Coarse	<25	<50	<100	<100
TP111 - [LAB_DUP]	0-0.1	Coarse	<25	<50	<100	**120**
TP112	0-0.1	Coarse	<25	<50	<100	<100
TP112	1.3-1.4	Coarse	<25	<50	<100	<100
TP113	0-0.1	Coarse	<25	<50	<100	<100
TP113	0.7-0.8	Coarse	<25	<50	<100	<100
SDUP101	-	Coarse	<25	<50	<100	<100
SDUP102	-	Coarse	<25	<50	<100	<100
Total Number of Samples			24	24	24	24
Maximum Value			<PQL	74	280	120

Concentration above the SAC **VALUE**
Concentration above the PQL **Bold**

MANAGEMENT LIMIT ASSESSMENT CRITERIA

Sample Reference	**Sample Depth**	**Soil Texture**	C_6-C_{10} (F1) plus BTEX	>C_{10}-C_{16} (F2) plus napthalene	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)
BH101	0.16-0.3	Coarse	700	1000	2500	10000
BH101 - [LAB_DUP]	0.16-0.3	Coarse	700	1000	2500	10000
BH102	0.05-0.25	Coarse	700	1000	2500	10000
BH102	0.5-0.8	Coarse	700	1000	2500	10000
BH103	0.05-0.2	Coarse	700	1000	2500	10000
BH104	0.05-0.2	Coarse	700	1000	2500	10000
BH105	0.05-0.2	Coarse	700	1000	2500	10000
BH106	0-0.1	Coarse	700	1000	2500	10000
TP107	0-0.1	Coarse	700	1000	2500	10000
TP107	0.9-1.1	Coarse	700	1000	2500	10000
TP108	0-0.1	Coarse	700	1000	2500	10000
TP108	0.4-0.5	Coarse	700	1000	2500	10000
BH109	0.03-0.2	Coarse	700	1000	2500	10000
BH109	0.5-0.95	Coarse	700	1000	2500	10000
TP110	0-0.1	Coarse	700	1000	2500	10000
TP110	1.0-1.1	Coarse	700	1000	2500	10000
TP111	0-0.1	Coarse	700	1000	2500	10000
TP111 - [LAB_DUP]	0-0.1	Coarse	700	1000	2500	10000
TP112	0-0.1	Coarse	700	1000	2500	10000
TP112	1.3-1.4	Coarse	700	1000	2500	10000
TP113	0-0.1	Coarse	700	1000	2500	10000
TP113	0.7-0.8	Coarse	700	1000	2500	10000
SDUP101	-	Coarse	700	1000	2500	10000
SDUP102	-	Coarse	700	1000	2500	10000

TABLE S4
SOIL LABORATORY RESULTS COMPARED T0 DIRECT CONTACT CRITERIA
All data in mg/kg unless stated otherwise

Analyte		C_6-C_{10}	>C_{10}-C_{16}	>C_{16}-C_{34}	>C_{34}-C_{40}	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	PID
PQL - Envirolab Services		25	50	100	100	0.2	0.5	1	1	1	
CRC 2011 -Direct contact Criteria		5,600	4,200	5,800	8,100	140	21,000	5,900	17,000	2,200	
Site Use		HIGH DENSITY RESIDENTIAL - DIRECT SOIL CONTACT									
Sample Reference	**Sample Depth**										
BH101	0.16-0.3	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH101 - [LAB_DUP]	0.16-0.3	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	-
BH102	0.05-0.25	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.3**
BH102	0.5-0.8	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH103	0.05-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH104	0.05-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.2**
BH105	0.05-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.3**
BH106	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.2**
TP107	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.2**
TP107	0.9-1.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.1**
TP108	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	
TP108	0.4-0.5	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.2**
BH109	0.03-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.3**
BH109	0.5-0.95	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.5**
TP110	0-0.1	<25	**74**	**280**	<100	<0.2	<0.5	<1	<1	<1	**0.2**
TP110	1.0-1.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.4**
TP111	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.3**
TP111 - [LAB_DUP]	0-0.1	<25	<50	<100	**120**	<0.2	<0.5	<1	<1	<1	-
TP112	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.1**
TP112	1.3-1.4	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.2**
TP113	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.4**
TP113	0.7-0.8	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.5**
SDUP101	-	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	-
SDUP102	-	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	-
Total Number of Samples		24	24	24	24	24	24	24	24	24	19
Maximum Value		<PQL	74	280	120	<PQL	<PQL	<PQL	<PQL	<PQL	0.5

Concentration above the SAC **VALUE**
Concentration above the PQL **Bold**

TABLE S5
ASBESTOS QUANTIFICATION - FIELD OBSERVATIONS AND LABORATORY RESULTS
HSL-B: Residential with minimal opportunities for soil access

FIELD DATA															LABORATORY DATA											
Date Sampled	Sample reference	Sample Depth	Visible ACM in top 100mm	Approx. Volume of Soil (L)	Soil Mass (g)	Mass ACM (g)	Mass Asbestos in ACM (g)	[Asbestos from ACM in soil] (%w/w)	Mass ACM <7mm (g)	Mass Asbestos in ACM <7mm (g)	[Asbestos from ACM <7mm in soil] (%w/w)	Mass FA (g)	Mass Asbestos in FA (g)	[Asbestos from FA in soil] (%w/w)	Lab Report Number	Sample refeference	Sample Depth	Sample Mass (g)	Asbestos ID in soil (AS4964) >0.1g/kg	Trace Analysis	Total Asbestos (g/kg)	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation (g)	FA and AF Estimation (g)	ACM >7mm Estimation %(w/w)	FA and AF Estimation %(w/w)
SAC			**No**					**0.04**			**0.001**			**0.001**											**0.04**	**0.001**
20/05/2024	BH101	0.16-0.6	No	<10L	2,890	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--		BH101	0.16-0.3		No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
20/05/2024	BH102	0.05-0.4	No	<10L	5,700	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--		BH102	0.05-0.25		No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		BH103	0.05-0.2		No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
20/05/2024	BH104	0.05-0.4	No	<10L	6,390	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--		BH104	0.05-0.2		No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
20/05/2024	BH105	0.05-0.4	No	<10L	3,800	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--		BH105	0.05-0.2		No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
21/05/2024	BH106	0-0.2	No		10,090	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--		BH106	0-0.1		No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
20/05/2024	TP107	0-0.1	No		10,020	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--		TP107	0-0.1		No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
20/05/2024	TP107	0.1-0.2	No		8,790	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
20/05/2024	TP107	0.2-0.5	No		10,780	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
20/05/2024	TP108	0-0.1	No		12,230	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
20/05/2024	TP108	0.1-0.5	No		10,230	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--		TP108	04-0.5		No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
20/05/2024	BH109	0.03-0.5	No		3,910	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--		BH109	0.03-0.2		No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
20/05/2024	TP110	0-0.1	No		12,160	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--		TP110	0-0.1		No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	Chrysotile	–	0.002	<0.01	<0.001
20/05/2024	TP110	0.1-0.6	No		11,980	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
20/05/2024	TP111	0-0.1	No		11,960	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--		TP111	0-0.1		No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
20/05/2024	TP111	0.1-0.4	No		10,110	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
20/05/2024	TP111	0.4-0.6	No		11,760	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
20/05/2024	TP112	0-0.1	No		12,150	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
20/05/2024	TP112	0.1-0.5	No		10,400	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
20/05/2024	TP112	0.5-0.9	No		10,330	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
20/05/2024	TP113	0-0.2	No		10,150	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
20/05/2024	TP113	0.2-1.1	No		10,900	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Concentration above the SAC **VALUE**

TABLE S6
SOIL LABORATORY RESULTS COMPARED TO NEPM 2013 EILs AND ESLs
All data in mg/kg unless stated otherwise

Land Use Category				URBAN RESIDENTIAL AND PUBLIC OPEN SPACE																		
							AGED HEAVY METALS-EILs						EILs		ESLs							
				pH	CEC (cmolc/kg)	Clay Content (% clay)	Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P
PQL - Envirolab Services				-	1	-	4	1	1	1	1	1	1	0.1	25	50	100	100	0.2	0.5	1	1	0.05
Ambient Background Concentration (ABC)				-	-	-	NSL	13	28	163	5	122	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**																			
BH101	0.16-0.3	F: Silty sand	Coarse	9	21	7	<4	**9**	**93**	<1	**52**	**36**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH101 - [LAB_DUP]	0.16-0.3	F: Silty sand	Coarse	9	21	7	<4	**8**	**69**	<1	**42**	**30**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH102	0.05-0.25	F: Silty sand	Coarse	9	21	7	<4	**4**	<1	**1**	<1	<1	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH102	0.5-0.8	Silty clay	Coarse	8.2	16	60	<4	**8**	**28**	**15**	**6**	**24**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH103	0.05-0.2	F: Silty sand	Coarse	9	21	7	<4	**9**	<1	<1	<1	<1	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH104	0.05-0.2	F: Silty sand	Coarse	9	21	7	<4	**5**	**5**	<1	**6**	**4**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH105	0.05-0.2	F: Silty sand	Coarse	9	21	7	<4	**10**	**15**	**9**	**9**	**17**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH106	0-0.1	F: Silty clay	Coarse	8.2	16	60	**7**	**19**	**34**	**100**	**11**	**180**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP107	0-0.1	F: Silty clay	Coarse	8.2	16	60	**11**	**23**	**69**	**110**	**11**	**160**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP107	0.9-1.1	Silty clay	Coarse	8.2	16	60	**8**	**18**	**33**	**27**	**13**	**58**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP108	0-0.1	F: Silty clay	Coarse	8.2	16	60	**7**	**13**	**26**	**110**	**9**	**120**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP108	0.4-0.5	F: Silty clay	Coarse	8.2	16	60	**8**	**19**	**26**	**77**	**12**	**88**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH109	0.03-0.2	F: Silty sand	Coarse	8.2	16	60	<4	**66**	**27**	**4**	**70**	**40**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH109	0.5-0.95	Silty clay	Coarse	8.2	16	60	**5**	**13**	**33**	**18**	**9**	**40**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP110	0-0.1	F: Silty clay	Coarse	8.2	16	60	**5**	**14**	**32**	**110**	**14**	**120**	<1	<0.1	<25	**74**	**280**	<100	<0.2	<0.5	<1	<1	**0.4**
TP110	1.0-1.1	Silty clay	Coarse	8.2	16	60	**5**	**14**	**34**	**19**	**8**	**41**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.09**
TP111	0-0.1	F: Silty sandy clay	Coarse	9	21	7	<4	**34**	**12**	**28**	**6**	**25**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP111 - [LAB_DUP]	0-0.1	F: Silty sandy clay	Coarse	9	21	7	<4	**10**	**18**	**34**	**9**	**41**	<1	<0.1	<25	<50	<100	**120**	<0.2	<0.5	<1	<1	<0.05
TP111 - [TRIPLICATE]	0-0.1	F: Silty sandy clay	Coarse	9	21	7	<4	**8**	**65**	<1	**42**	**30**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP112	0-0.1	F: Silty clay	Coarse	8.2	16	60	**7**	**17**	**58**	**180**	**16**	**180**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.54**
TP112	1.3-1.4	Silty clay	Coarse	8.2	16	60	**5**	**14**	**29**	**20**	**8**	**43**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP113	0-0.1	F: Silty clay	Coarse	8.2	16	60	**8**	**20**	**59**	**460**	**15**	**310**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.2**
TP113	0.7-0.8	F: Silty clay	Coarse	8.2	16	60	**6**	**15**	**33**	**93**	**10**	**81**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDUP101	-	F: Silty clay	Coarse	8.2	16	60	**5**	**10**	**20**	**73**	**7**	**78**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDUP102	-	F: Silty sand	Coarse	9	21	7	<4	**8**	**79**	<1	**46**	**31**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
Total Number of Samples				25	25	25	25	25	25	25	25	25	24	18	24	24	24	24	24	24	24	24	24
Maximum Value				9	21	60	11	66	93	460	70	310	<PQL	<PQL	<PQL	74	280	120	<PQL	<PQL	<PQL	<PQL	0.54

Concentration above the SAC **VALUE**
Concentration above the PQL **Bold**
The guideline corresponding to the elevated value is highlighted in grey in the EIL and ESL Assessment Criteria Table below

EIL AND ESL ASSESSMENT CRITERIA

Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**	pH	CEC (cmolc/kg)	Clay Content (% clay)	Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P
BH101	0.16-0.3	F: Silty sand	Coarse	9	21	7	100	410	250	1300	360	1100	170	180	180	120	300	2800	50	85	70	105	20
BH101 - [LAB_DUP]	0.16-0.3	F: Silty sand	Coarse	9	21	7	100	410	250	1300	360	1100	170	180	180	120	300	2800	50	85	70	105	20
BH102	0.05-0.25	F: Silty sand	Coarse	9	21	7	100	410	250	1300	360	1100	170	180	180	120	300	2800	50	85	70	105	20
BH102	0.5-0.8	Silty clay	Coarse	8.2	16	60	100	410	240	1300	280	820	170	--	180	120	300	2800	50	85	70	105	20
BH103	0.05-0.2	F: Silty sand	Coarse	9	21	7	100	410	250	1300	360	1100	170	180	180	120	300	2800	50	85	70	105	20
BH104	0.05-0.2	F: Silty sand	Coarse	9	21	7	100	410	250	1300	360	1100	170	180	180	120	300	2800	50	85	70	105	20
BH105	0.05-0.2	F: Silty sand	Coarse	9	21	7	100	410	250	1300	360	1100	170	180	180	120	300	2800	50	85	70	105	20
BH106	0-0.1	F: Silty clay	Coarse	8.2	16	60	100	410	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
TP107	0-0.1	F: Silty clay	Coarse	8.2	16	60	100	410	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
TP107	0.9-1.1	Silty clay	Coarse	8.2	16	60	100	410	240	1300	280	820	170	--	180	120	300	2800	50	85	70	105	20
TP108	0-0.1	F: Silty clay	Coarse	8.2	16	60	100	410	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
TP108	0.4-0.5	F: Silty clay	Coarse	8.2	16	60	100	410	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
BH109	0.03-0.2	F: Silty sand	Coarse	8.2	16	60	100	410	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
BH109	0.5-0.95	Silty clay	Coarse	8.2	16	60	100	410	240	1300	280	820	170	--	180	120	300	2800	50	85	70	105	20
TP110	0-0.1	F: Silty clay	Coarse	8.2	16	60	100	410	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
TP110	1.0-1.1	Silty clay	Coarse	8.2	16	60	100	410	240	1300	280	820	170	--	180	120	300	2800	50	85	70	105	20
TP111	0-0.1	F: Silty sandy clay	Coarse	9	21	7	100	410	250	1300	360	1100	170	180	180	120	300	2800	50	85	70	105	20
TP111 - [LAB_DUP]	0-0.1	F: Silty sandy clay	Coarse	9	21	7	100	410	250	1300	360	1100	170	180	180	120	300	2800	50	85	70	105	20
TP111 - [TRIPLICATE]	0-0.1	F: Silty sandy clay	Coarse	9	21	7	100	410	250	1300	360	1100	--	--	--	--	--	--	--	--	--	--	--
TP112	0-0.1	F: Silty clay	Coarse	8.2	16	60	100	410	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
TP112	1.3-1.4	Silty clay	Coarse	8.2	16	60	100	410	240	1300	280	820	170	--	180	120	300	2800	50	85	70	105	20
TP113	0-0.1	F: Silty clay	Coarse	8.2	16	60	100	410	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
TP113	0.7-0.8	F: Silty clay	Coarse	8.2	16	60	100	410	240	1300	280	820	170	--	180	120	300	2800	50	85	70	105	20
SDUP101	-	F: Silty clay	Coarse	8.2	16	60	100	410	240	1300	280	820	170	180	180	120	300	2800	50	85	70	105	20
SDUP102	-	F: Silty sand	Coarse	9	21	7	100	410	250	1300	360	1100	170	180	180	120	300	2800	50	85	70	105	20

TABLE S7
SOIL LABORATORY RESULTS COMPARED TO WASTE CLASSIFICATION GUIDELINES
All data in mg/kg unless stated otherwise

			HEAVY METALS								PAHs		OC/OP PESTICIDES				Total PCBs	TRH					BTEX COMPOUNDS				ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P	Total Endosulfans	Chloropyrifos	Total Moderately Harmful	Total Scheduled		C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	Total C_{10}-C_{36}	Benzene	Toluene	Ethyl benzene	Total Xylenes	
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.05	0.1	0.1	0.1	0.1	0.1	25	50	100	100	50	0.2	0.5	1	1	100
General Solid Waste CT1			100	20	100	NSL	100	4	40	NSL	200	0.8	60	4	250	50	50	650		NSL		10,000	10	288	600	1,000	-
General Solid Waste SCC1			500	100	1900	NSL	1500	50	1050	NSL	200	10	108	7.5	250	50	50	650		NSL		10,000	18	518	1,080	1,800	-
Restricted Solid Waste CT2			400	80	400	NSL	400	16	160	NSL	800	3.2	240	16	1000	50	50	2600		NSL		40,000	40	1,152	2,400	4,000	-
Restricted Solid Waste SCC2			2000	400	7600	NSL	6000	200	4200	NSL	800	23	432	30	1000	50	50	2600		NSL		40,000	72	2,073	4,320	7,200	-
Sample Reference	**Sample Depth**	**Sample Description**																									
BH101	0.16-0.3	F: Silty sand	<4	<0.4	**9**	**93**	<1	<0.1	**52**	**36**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH101 - [LAB_DUP]	0.16-0.3	F: Silty sand	<4	<0.4	**8**	**69**	<1	<0.1	**42**	**30**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH102	0.05-0.25	Fill: Silty sand	<4	<0.4	**4**	<1	**1**	<0.1	<1	<1	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH102	0.5-0.8	Silty clay	<4	<0.4	**8**	**28**	**15**	<0.1	**6**	**24**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH103	0.05-0.2	F: Silty sand	<4	<0.4	**9**	<1	<1	<0.1	<1	<1	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH104	0.05-0.2	Fill: Silty sand	<4	<0.4	**5**	**5**	<1	<0.1	**6**	**4**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH105	0.05-0.2	F: Silty sand	<4	<0.4	**10**	**15**	**9**	<0.1	**9**	**17**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH106	0-0.1	F: Silty clay	**7**	<0.4	**19**	**34**	**100**	<0.1	**11**	**180**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
TP107	0-0.1	F: Silty clay	**11**	**0.7**	**23**	**69**	**110**	<0.1	**11**	**160**	**0.2**	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
TP107	0.9-1.1	Silty clay	**8**	<0.4	**18**	**33**	**27**	<0.1	**13**	**58**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
TP108	0-0.1	F: Silty clay	**7**	<0.4	**13**	**26**	**110**	**0.1**	**9**	**120**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
TP108	0.4-0.5	F: Silty clay	**8**	<0.4	**19**	**26**	**77**	**0.1**	**12**	**88**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH109	0.03-0.2	F: Silty sand	<4	<0.4	**66**	**27**	**4**	<0.1	**70**	**40**	**0.3**	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH109	0.5-0.95	Silty clay	**5**	<0.4	**13**	**33**	**18**	<0.1	**9**	**40**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
TP110	0-0.1	F: Silty clay	**5**	**0.4**	**14**	**32**	**110**	<0.1	**14**	**120**	**2.6**	**0.4**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	**200**	**180**	**380**	<0.2	<0.5	<1	<1	Detected
TP110	1.0-1.1	Silty clay	**5**	<0.4	**14**	**34**	**19**	<0.1	**8**	**41**	**0.09**	**0.09**	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
TP111	0-0.1	F: Silty sandy clay	<4	<0.4	**34**	**12**	**28**	<0.1	**6**	**25**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
TP111 - [LAB_DUP]	0-0.1	F: Silty sandy clay	<4	<0.4	**10**	**18**	**34**	<0.1	**9**	**41**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
TP111 - [TRIPLICATE]	0-0.1	F: Silty sandy clay	<4	<0.4	**8**	**65**	<1	<0.1	**42**	**30**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP112	0-0.1	F: Silty clay	**7**	<0.4	**17**	**58**	**180**	**0.1**	**16**	**180**	**3.8**	**0.54**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
TP112	1.3-1.4	Silty clay	**5**	<0.4	**14**	**29**	**20**	<0.1	**8**	**43**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
TP113	0-0.1	F: Silty clay	**8**	<0.4	**20**	**59**	**460**	**0.4**	**15**	**310**	**2.2**	**0.2**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
TP113	0.7-0.8	F: Silty clay	**6**	<0.4	**15**	**33**	**93**	**0.1**	**10**	**81**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
SDUP101	-	F: Silty clay	**5**	<0.4	**10**	**20**	**73**	<0.1	**7**	**78**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
SDUP102	-	F: Silty sand	<4	<0.4	**8**	**79**	<1	<0.1	**46**	**31**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
FCF101	-	Material	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Detected
Total Number of Samples			25	25	25	25	25	25	25	25	24	24	18	18	18	18	18	24	24	24	24	24	24	24	24	24	15
Maximum Value			11	0.7	66	93	460	0.4	70	310	3.8	0.54	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	200	180	380	<PQL	<PQL	<PQL	<PQL	Detected

Concentration above the CT1 — **VALUE**
Concentration above SCC1 — **VALUE**
Concentration above the SCC2 — **VALUE**
Concentration above PQL — **Bold**
Asbestos Detected > Special Waste (asbestos) — **Detected**

TABLE S8
SOIL LABORATORY TCLP RESULTS
All data in mg/L unless stated otherwise

			Lead	Nickel
PQL - Envirolab Services			0.03	0.02
TCLP1 - General Solid Waste			5	2
TCLP2 - Restricted Solid Waste			20	8
TCLP3 - Hazardous Waste			>20	>8
Sample Reference	**Sample Depth**	**Sample Description**		
BH101	0.16-0.3	F: Silty sand	NA	**0.2**
TP107	0-0.1	F: Silty clay	<0.03	NA
BH109	0.03-0.2	F: Silty sand	NA	**0.08**
TP110	0-0.1	F: Silty clay	<0.03	NA
TP112	0-0.1	F: Silty clay	**0.03**	NA
TP113	0-0.1	F: Silty clay	**0.05**	NA
Total Number of samples			4	2
Maximum Value			0.05	0.2

General Solid Waste	**VALUE**
Restricted Solid Waste	**VALUE**
Hazardous Waste	**VALUE**
Concentration above PQL	**Bold**

Detailed Site Investigation
3 Old Menangle Road, Campbelltown, NSW
E36287BL

TABLE Q1
SOIL QA/QC SUMMARY

			TRH C6 - C10	TRH >C10-C16	TRH >C16-C34	TRH >C34-C40	Benzene	Toluene	Ethylbenzene	m+p-xylene	o-Xylene	Naphthalene	Acenaphthylene	Acenaph-thene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b,j+k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenzo(a,h)anthra-cene	Benzo(g,h,i)perylene
	PQL Envirolab SYD		25	50	100	100	0.2	0.5	1	2	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.05	0.1	0.1	0.1
	PQL Envirolab VIC		25	50	100	100	0.2	0.5	1.0	2.0	1.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1
Intra	TP108	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
laboratory	SDUP101	-	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Intra	BH101	0.16-0.3	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
laboratory	SDUP102	-	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Field Blank	TB-101 20/05/24	-	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
Field Blank	TB-102 20/05/24	-	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
Trip Spike	TS-101 20/05/24		-	-	-	-	106%	106%	103%	110%	103%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trip Spike	TS-102 20/05/24		-	-	-	-	108%	106%	106%	118%	107%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Rinsate	FR101-HA 21/05/24	µg/L	<10	170	250	<100	<1	<1	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1

			HCB	alpha- BHC	gamma- BHC	beta- BHC	Heptachlor	delta- BHC	Aldrin	Heptachlor Epoxide	Gamma- Chlordane	alpha- chlordane	Endosulfan I	pp- DDE	Dieldrin	Endrin	pp- DDD	Endosulfan II	pp- DDT	Endrin Aldehyde	Endosulfan Sulphate	Methoxychlor
	PQL Envirolab SYD		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PQL Envirolab VIC		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Intra	TP108	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
laboratory	SDUP101	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Intra	BH101	0.16-0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
laboratory	SDUP102	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Field Blank	TB-101 20/05/24	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Field Blank	TB-102 20/05/24	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trip Spike	TS-101 20/05/24		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trip Spike	TS-102 20/05/24		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Rinsate	FR101-HA 21/05/24	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

			Azinphos-methyl (Guthion)	Bromophos-ethyl	Chlorpyriphos	Chlorpyriphos-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenitrothion	Malathion	Parathion	Ronnel	Total PCBS	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
	PQL Envirolab SYD		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	4	0.4	1	1	1	0.1	1	1
	PQL Envirolab VIC		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	4.0	0.4	1.0	1.0	1.0	0.1	1.0	1.0
Intra	TP108	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	7	<0.4	13	26	110	0.1	9	120
laboratory	SDUP101	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	5	<0.4	10	20	73	<0.1	7	78
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	6	nc	11.5	23	91.5	0.075	8	99
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	33%	nc	26%	26%	40%	67%	25%	42%
Intra	BH101	0.16-0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<4	<0.4	9	93	<1	<0.1	52	36
laboratory	SDUP102	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<4	<0.4	8	79	<1	<0.1	46	31
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	8.5	86	nc	nc	49	33.5
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	12%	16%	nc	nc	12%	15%
Field Blank	TB-101 20/05/24	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<4	<0.4	3	<1	3	<0.1	<1	1
Field Blank	TB-102 20/05/24	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<4	<0.4	4	<1	5	<0.1	<1	2
Trip Spike	TS-101 20/05/24		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trip Spike	TS-102 20/05/24		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Rinsate	FR101-HA 21/05/24	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.01	<0.01	0.04	<0.03	<0.0005	<0.02	0.04

Result outside of QA/QC acceptance criteria (highlighted)

Rinsate metals results in mg/L

ABBREVIATIONS AND EXPLANATIONS

Abbreviations used in the Tables:

ADWG: AustralianDrinking Water Guidelines
ANZG Australian and New Zealand Guidelines
B(a)P: Benzo(a)pyrene
CRC: Cooperative Research Centre
ESLs: Ecological Screening Levels
GIL: Groundwater Investigation Levels
HILs: Health Investigation Levels
HSLs: Health Screening Levels
HSL-SSA: Health Screening Level-SiteSpecific Assessment
NA: Not Analysed
NC: Not Calculated
NEPM: National Environmental Protection Measure
NHMRC: National Health and Medical Research Council
NL: Not Limiting
NSL: No Set Limit
OCP: Organochlorine Pesticides
OPP: Organophosphorus Pesticides
PAHs: Polycyclic Aromatic Hydrocarbons
ppm: Parts per million
PCBs: Polychlorinated Biphenyls
PCE: Perchloroethylene (Tetrachloroethylene or Tetrachloroethene)
PQL: Practical Quantitation Limit
RS: Rinsate Sample
RSL: Regional Screening Levels
SAC: Site Assessment Criteria
SSA: Site Specific Assessment
SSHSLs: Site Specific Health Screening Levels
TB: Trip Blank
TCA: 1,1,1 Trichloroethane (methyl chloroform)
TCE: Trichloroethylene (Trichloroethene)
TS: Trip Spike
TRH: Total Recoverable Hydrocarbons
UCL: Upper Level Confidence Limit on Mean Value
USEPA United States Environmental Protection Agency
VOCC: Volatile Organic Chlorinated Compounds
WHO: World Health Organisation

JKEnvironments

TABLE G1
SUMMARY OF GROUNDWATER LABORATORY RESULTS COMPARED TO ECOLOGICAL GILs SAC
All results in µg/L unless stated otherwise.

	PQL Envirolab Services	ANZG 2018 Fresh Waters	SAMPLES					
			MW1	MW1 - [LAB_DUP]	MW2	MW2 - [LAB_DUP]	WDUP101	WDUP102
Inorganic Compounds and Parameters								
pH		6.5 - 8.5	**7.7**	NA	**6.3**	NA	NA	NA
Electrical Conductivity (µS/cm)	1	NSL	**1600**	NA	**11000**	NA	NA	NA
Turbidity (NTU)		NSL	NA	NA	NA	NA	NA	NA
Metals and Metalloids								
Arsenic (As lll)	1	24	<1	NA	<1	<1	<1	<2
Cadmium	0.1	0.2	<0.1	NA	<0.1	<0.1	<0.1	<0.2
Chromium (SAC for Cr III adopted)	1	3.3	<1	NA	<1	<1	<1	<2
Copper	1	1.4	<1	NA	<1	<1	<1	<2
Lead	1	3.4	<1	NA	<1	<1	<1	<2
Total Mercury (inorganic)	0.05	0.06	<0.05	NA	<0.05	NA	<0.05	<0.050
Nickel	1	11	<1	NA	**7**	**7**	<1	**7.8**
Zinc	1	8	**2**	NA	**24**	**26**	**2**	**22**
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)								
Benzene	1	950	<1	<1	<1	NA	<1	<1
Toluene	1	180	<1	<1	<1	NA	<1	<1
Ethylbenzene	1	80	<1	<1	<1	NA	<1	<1
m+p-xylene	2	75	<2	<2	<2	NA	<2	<2
o-xylene	1	350	<1	<1	<1	NA	<1	<1
Total xylenes	2	NSL	<2	<2	<2	NA	NA	NA
Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	0.2	16	<0.1	<0.1	<0.1	NA	<0.1	<0.1
Acenaphthylene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1
Acenaphthene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1
Fluorene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1
Phenanthrene	0.1	0.6	<0.1	<0.1	<0.1	NA	<0.1	<0.1
Anthracene	0.1	0.01	<0.1	<0.1	<0.1	NA	<0.1	<0.1
Fluoranthene	0.1	1	<0.1	<0.1	<0.1	NA	<0.1	<0.1
Pyrene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1
Benzo(a)anthracene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1
Chrysene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1
Benzo(b,j+k)fluoranthene	0.2	NSL	<0.2	<0.2	<0.2	NA	<0.2	<0.2
Benzo(a)pyrene	0.1	0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1
Dibenzo(a,h)anthracene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1
Benzo(g,h,i)perylene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1

Concentration above the SAC	**VALUE**
Concentration above the PQL	**Bold**
GIL >PQL	Red

TABLE G2
SUMMARY OF GROUNDWATER LABORATORY RESULTS COMPARED TO HUMAN CONTACT GILs
All results in µg/L unless stated otherwise.

	PQL Envirolab Services	Recreational (10 x NHMRC ADWG)	SAMPLES					
			MW1	MW1 - [LAB_DUP]	MW2	MW2 - [LAB_DUP]	WDUP101	WDUP102
Inorganic Compounds and Parameters								
pH		6.5 - 8.5	**7.7**	NA	**6.3**	NA	NA	NA
Electrical Conductivity (µS/cm)	1	NSL	**1600**	NA	**11000**	NA	NA	NA
Turbidity (NTU)		NSL	NA	NA	NA	NA	NA	NA
Metals and Metalloids								
Arsenic (As lll)	1	100	<1	NA	<1	<1	<1	<2
Cadmium	0.1	20	<0.1	NA	<0.1	<0.1	<0.1	<0.2
Chromium (total)	1	500	<1	NA	<1	<1	<1	<2
Copper	1	20000	<1	NA	<1	<1	<1	<2
Lead	1	100	<1	NA	<1	<1	<1	<2
Total Mercury (inorganic)	0.05	10	<0.05	NA	<0.05	NA	<0.05	<0.050
Nickel	1	200	<1	NA	**7**	**7**	<1	**7.8**
Zinc	1	30000	**2**	NA	**24**	**26**	**2**	**22**
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)								
Benzene	1	10	<1	<1	<1	NA	<1	<1
Toluene	1	8000	<1	<1	<1	NA	<1	<1
Ethylbenzene	1	3000	<1	<1	<1	NA	<1	<1
m+p-xylene	2	NSL	<2	<2	<2	NA	<2	<2
o-xylene	1	NSL	<1	<1	<1	NA	<1	<1
Total xylenes	2	6000	<2	<2	<2	NA	NA	NA
Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	0.2	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1
Acenaphthylene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1
Acenaphthene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1
Fluorene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1
Phenanthrene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1
Anthracene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1
Fluoranthene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1
Pyrene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1
Benzo(a)anthracene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1
Chrysene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1
Benzo(b,j+k)fluoranthene	0.2	NSL	<0.2	<0.2	<0.2	NA	<0.2	<0.2
Benzo(a)pyrene	0.1	0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1
Dibenzo(a,h)anthracene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1
Benzo(g,h,i)perylene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1

Concentration above the SAC — **VALUE**
Concentration above the PQL — **Bold**
GIL >PQL — Red

TABLE G3
GROUNDWATER LABORATORY RESULTS COMPARED TO SITE SPECIFIC HSLs - RISK ASSESSMENT
All results in µg/L unless stated otherwise.

	PQL Envirolab Services	NHMRC ADWG 2011	WHO 2008	USEPA RSL Tapwater 2017	SAMPLES					
					MW1	MW1 - [LAB_DUP]	MW2	MW2 - [LAB_DUP]	WDUP101	WDUP102
Total Recoverable Hydrocarbons (TRH)										
C_6-C_9 Aliphatics (assessed using F1)	10	-	100	-	<10	<10	<10	NA	<10	<10
>C_9-C_{14} Aliphatics (assessed using F2)	50	-	100	-	<50	<50	<50	NA	<50	<50
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)										
Benzene	1	1	-	-	<1	<1	<1	NA	<1	<1
Toluene	1	800	-	-	<1	<1	<1	NA	<1	<1
Ethylbenzene	1	300	-	-	<1	<1	<1	NA	<1	<1
Total xylenes	2	600	-	-	<2	<2	<2	NA	NA	NA
Polycyclic Aromatic Hydrocarbons (PAHs)										
Naphthalene	1	-	-	6.1	<1	<1	<1	NA	<1	<1

Concentration above the SAC — **VALUE**
Concentration above the PQL — **Bold**
GIL >PQL — Red

TABLE Q2
GROUNDWATER QA/QC SUMMARY

		TRH C6 - C10	TRH >C10-C16	TRH >C16-C34	TRH >C34-C40	Benzene	Toluene	Ethylbenzene	m+p-xylene	o-Xylene	Naphthalene	Acenaphthylene	Acenaph-thene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b,j+k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenzo(a,h)anthra-cene	Benzo(g,h,i)perylene	Arsenic	Cadmium	Chromium VI	Copper	Lead	Mercury	Nickel	Zinc
	PQL Envirolab SYD	*10*	*50*	*100*	*100*	*1*	*1*	*1*	*2*	*1*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*1*	*0.1*	*1*	*1*	*1*	*0.05*	*1*	*1*
	PQL Envirolab VIC	*10*	*50*	*100*	*100*	*1.0*	*1.0*	*1.0*	*2.0*	*1.0*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*1*	*0.1*	*1*	*1*	*1*	*0.05*	*1*	*1*
Intra	MW1	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<1	<1	<1	<0.05	<1	2
laboratory	WDUP101	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<1	<1	<1	<0.05	<1	2
duplicate	MEAN	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	nc	nc	nc	nc	2
	RPD %	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	nc	nc	nc	nc	0%
Inter	MW2	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<1	<1	<1	<0.05	7	24
laboratory	WDUP102	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.20	<0.10	<0.10	<0.10	<0.10	<2	<0.2	<2	<2	<2	<0.050	7.8	22
duplicate	MEAN	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	nc	nc	nc	7.4	23
	RPD %	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	nc	nc	nc	11%	9%
Field	TB-W101	<10	150	<100	<100	<1	<1	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<1	<1	<1	<0.05	<1	<1
Blank	27/05/2024																																
Trip	TS-W101	-	-	-	-	102%	96%	100%	94%	90%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	27/05/2024																																

Result outside of QA/QC acceptance criteria Value

Appendix D: Waste and Imported Materials Tracking Template

Imported Materials Register

Supplier	Date	Docket/Invoice #	Product Type	Quantity (specify m3 or tonnes)	Area where Material was Placed

Exported (Waste) Materials Register

Load	Date	Material Type / Classification	Site Area where Waste was Generated	Waste Classification Report Reference	Disposal Facility	Tipping Receipt/Docket Number	Tracking Number (where relevant)	Tonnage

Appendix E: Guidelines and Reference Documents

Contaminated Land Management Act 1997 (NSW)

Environmental Planning and Assessment Act 1979 (NSW)

Managing Land Contamination, Planning Guidelines SEPP55 – Remediation of Land (1998)

NSW EPA, (2015). Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997

NSW EPA, (2017). Guidelines for the NSW Site Auditor Scheme, 3rd Edition

NSW EPA, (2020). Consultants Reporting on Contaminated Land, Contaminated Land Guidelines

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

Protection of the Environment Operations Act 1997 (NSW)

State Environmental Planning Policy (Resilience and Hazards) 2011 (NSW)

Work Health and Safety Regulation 2017 (NSW)

Western Australian Department of Health, (2021). Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia