Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

Remedial Action Plan

Prepared for:	Avakian Holdings (NSW)Pty Ltd
Site Address	35-39 Carter Road, Brookvale, NSW
Prepared by	Jeffrey Yu • Principal Environmental Consultant • Occupational Hygienist • Certified Environmental Practitioner (#1516) • Licensed Asbestos Assessor (#001366) • PhD (EnvEng), PhD (MediChem)
Reference. No.	DRYU665J_RAP_V1_35-39 Carter Road, Brookvale, NSW_12072025.

12 July 2025

DR UPSILON ENVIRONMENTS PTY LTD
ABN 91 647 732 518
PO Box 289, Kingsford, NSW
Phone: 0406 201 136
Email: jeffrey.yu@DrUpsilonGroup.com
Web: www.DrUpsilonGroup.com.au

Document History and Status

Rev	Status	Description	Author	Reviewer	Release Date
1	Final	For submission	Jeffrey YU		12/07/2025

Distribution of Copies

Rev	Format	Issued To
1	Electronic (Email)	Avakian Holdings (NSW)Pty Ltd DRYU Electronic Storage System

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

Contents

Tables

Figures

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

Abbreviations

ACM	Asbestos Containing Material
AEC	Area of Environmental Concern
AHD	Australian Height Datum
AMP	Asbestos Management Plan
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure
ASS	Acid Sulfate Soils
ASI	Additional Site Investigation
BGL	Below ground level
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
COPC	Contaminant of Potential Concern
Council	Canterbury Bankstown Council
CSM	Conceptual Site Model
DA	Development Application
DQI	Data Quality Indicator
DQO	Data Quality Objective
DSI	Detailed Site Investigation
EIL	Ecological Investigation Level
ESL	Ecological Screening Level
EP&A	Environmental Planning and Assessment
DRYU	Dr Upsilon Environments Pty Ltd
HIL	Health Investigation Level
HSL	Health Screening Level
IL	Investigation Level
LOR	Limit of Reporting
NATA	National Association of Testing Authorities, Australia
NEPC	National Environment Protection Council
NSW EPA	Environment Protection Authority of New South Wales
NSW OEH	Office of Environment and Heritage of New South Wales
OCP	Organochlorine Pesticide
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
PPE	Personal Protective Equipment
QA	Quality Assurance

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

QC	Quality Control
RAP	Remediation Action Plan
RPD	Relative Percent Difference
SEPP	State Environmental Planning Policy
SWMS	Safe Work Method Statement
TRH	Total Recoverable Hydrocarbon
PFAS	Per- and Polyfluoroalkyl Substances
VENM	Virgin Excavated Natural Material

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

Executive Summary

Dr Upsilon Environments Pty Ltd ("DRYU") was commissioned by Avakian Holdings (NSW)Pty Ltd ("**The Client**") on 11 July 2025 to perform a Remedial Action Plan report ("**RAP**") in order to assist in the proposed the proposed mixed-use development (DA2025/0042), "Alterations and additions to industrial development - Demolition works and construction of a mixed use development including light industry, a vehicle body repair workshop, a take away food and drink premises and business identification signage", at 35-39 Carter Road, Brookvale, NSW to Northern Beaches Council ("**The Council**").

The architectural plans (Ref. No.: Ref. No. 3857, DA 000~442, Issue A, Figgis & Jefferson Tepa Architects, dated 17 January 2025) were made available for reference. The proposed soil disturbance could include the following:

1. The excavation of 37-39 Carter Road for around 1.3 m on average below existing ground level and minor fill around 0.24 m on average at the front entry
2. No excavation will be conducted at 35 Carter Road
3. Slab demolition
4. landscaping

The objectives of the RAP were to:

- Summarise the characteristics of the Site;
- Define the extent of contamination and define the scope of remediation required;
- Identify potential remediation options and justify the selection of the preferred remediation option;
- Outline the methodology required to implement the preferred remediation option;
- Outline regulatory environments applicable to the remediation works;
- Outline requirements for the protection of human health and the environment during the remediation works; and
- Establish validation criteria in order to validate and to render the site suitable for the industrial land use.

In order for the asbestos impacted soils from **RAP Areas** to be disposed of at a waste disposal facility, a waste classification report will need to be prepared. This report should be prepared by a suitably qualified environmental consultant in accordance with the NSW EPA (2014) *Waste Classification Guidelines*.

The results of DRYU soil characterisation assessment reports can be used to prepare the waste classification report for RAP Areas. Should the environmental consultant consider that additional sampling is required to confirm the waste classification, this should be discussed with the Client prior to preparation of the waste classification report.

The procedure that should be followed for the remediation and off-site disposal of contaminated soils is outlined below, as shown in Appendix 1 – DRYU DSI Sampling and RAP Site Layout and Table 3.

- The RAP Asbestos Impacted area (**~500 m^2**) should be marked out with spray paint or similar prior to excavation.
- The approximate lateral extent (as shown in Appendix 1 – DRYU DSI Sampling and RAP Site Layout) of digging/excavation to be undertaken is as follows:

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

  - The approximate remediation area excludes the extent of the soils to any underground/ground services facilities
- Excavation in **RAP Impacted Area** is to be extended to either the underlying virgin natural materials, after the removal of fill (up to approximately **0.5 m below initial ground surface**) before inspection, validation and landscaping.
- The contaminated soils are to be temporarily stockpiled on-site away from tree droplines or loaded directly with double-bagged asbestos bag or heavy-duty plastic into waste disposal trucks with waste classification.
- The spoil is to be disposed off-site at a facility licensed to accept the classification of waste that is applied to the material and in accordance with the waste classification report. Based on DRYU visual inspection and previous soil characterisation assessment reports, the following waste classification may apply:
  - Remediation Areas 01~02: **RAP Impacted Area** – General Solid Waste (non-putrescible)-Special Waste (Asbestos), subject to the chemical testing of the stockpile;
  - If the entire volume of contaminated soil is mixed – Special Waste-Asbestos, General Solid Waste (non-putrescible) with the requirement of waste classification for the stockpile.
  - Spoil from other excavation areas: General Solid Waste (non-putrescible) with the requirement of waste classification for offsite disposal
- If soils are to be stockpiled separately, the materials should be put on top of 2 mm plastic and covered with a layer of high visibility geofabric materials (or equivalent) to prevent airborne dispersion of asbestos fibres. Excavation and movement of all bonded ACM soils are required to be supervised by a Class A Licensed Asbestos Removalist supervisor and suitably qualified Environmental Consultant/Occupational Hygienist (i.e., DRYU). A relevant Asbestos Removal Control Plan ("**ARCP**") should be developed and reviewed for friable asbestos impacted soil report by a Class A asbestos removalist company. The **ARCP** will address the risks associated with ACM and controls to be implemented during works to mitigate the possibility of airborne asbestos exposure to contractors, clients and visitors on Site.
- Waste disposal trucks transporting contaminated soil from the Site are to be covered during transport. Waste disposal documentation should be retained by the Client, or its subcontractors, for each load of contaminated soil leaving the Site in order to verify that the contaminated soils have been appropriately disposed.
- The environmental consultant shall be engaged for onsite supervision works and will be required to keep a photographic record as part of the validation process (refer to Validation Plan of this RAP).

The underlying natural sand at this site shall be validated to meet the Resource Recovery Exemption – Excavated Natural Material (ENM) Exemption (2014), thereby fulfilling legislative obligations of the Protection of the Environment Operations (Waste) Regulation 2014.

The proposed construction will generate a large volume of excess soil requiring offsite disposal. It is important to keep non-impacted materials separated from contaminated soils.

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

Non-impacted fill materials (confirmed through validation sampling) can be either reused onsite or potentially disposed offsite at as General Solid Waste.

Contingency and Onsite Supervision

There is uncertainty of the extent of the contamination for the fill layer(s) across the whole lot, remediation areas may have been assumed and may change based on onsite environmental supervision during real earthworks and validation results.

Both Unexpected finds protocol and waste classification for the fill materials across the lot shall be prepared and implemented for the uncertainty during demolition / earthwork stage. During excavation works across the whole lot, a competent and qualified environmental consult shall be commissioned for the on-site supervision.

Conclusion and Recommendation

DRYU concludes that the site can be made **suitable** for the proposed mixed-use development, provided that the proper implementation of this RAP by a competent contractor with onsite supervision by a competent and qualified environmental consultant during demolition and earthwork stage.

This report shall be read in full and in conjunction with the referred DRYU reports.

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

1 Introduction

1.1 General

Dr Upsilon Environments Pty Ltd ("DRYU") was commissioned by Avakian Holdings (NSW) Pty Ltd ("**The Client**") ("**The Client**") on 11 July 2025 to perform a Remedial Action Plan report ("**RAP")** in order to assist in the proposed mixed-use development (DA2025/0042), "Alterations and additions to industrial development - Demolition works and construction of a mixed use development including light industry, a vehicle body repair workshop, a take away food and drink premises and business identification signage", at 35-39 Carter Road, Brookvale, NSW to Northern Beaches Council ("**The Council**").

On the basis of the previous reports and site information, DRYU proposes that the Site can be made suitable for the proposed mixed-use development, subject to preparation of a Remedial Action Plan and the completion of remediation works in order to comply with pre-lodgement DA conditions from the Council and relevant regulations.

This RAP has been prepared in accordance with the relevant sections of the following documents:

- National Environment Protection (Assessment of Site Contamination) Measure 1999 – 2013 Amendment (NEPC, 2013, hereafter referred to as the "ASC NEPM")
- Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997 (NSW EPA, 2015; hereafter referred to as the 'Duty to Report Guidelines')
- Consultants Reporting on Contaminated Land: Contaminated Land Guidelines (NSW EPA, 2020, referred to as the "Consultant reporting Guidelines")
- Sampling Design Part 1 – Application: Contaminated Land Guidelines (NSW EPA, 2022, referred to as the "Sampling Design Guidelines")
- NSW EPA (2022) Sampling Design Part 2 – Interpretation: Contaminated Land Guidelines (NSW EPA, 2022, referred to as the "Sampling Design Guidelines");
- Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (The WA Department of Health, 2021, referred to as the "WA Asbestos Guideline")

The previous investigation reports were also referred to in this report:

- Detailed Site Investigation and Assessment Report (Ref. No.: DRYU642J_DSI_V1_35-39 Carter Road, Brookvale, NSW_25062025, DRYU, dated 25 June 2025)
- Stage One Preliminary Site Investigation Report (DRYU412J_PSI_V1_35-39 Carter Road, Brookvale, NSW_01072024, DRYU, dated 01 July 2024)

1.2 Objectives

The objectives of the RAP were to:

- Summarise the characteristics of the Site;
- Define the extent and nature of contamination;
- Identify potential remediation options and justify the selection of the preferred remediation option;
- Outline the methodology required to implement the preferred remediation option;

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

- Outline regulatory environments applicable to the remediation works;
- Outline requirements for the protection of human health and the environment during the remediation works; and
- Establish validation criteria in order to validate the Site to a level suitable for the commercial land use.

1.3 Scope of Work

In order to assist the Client in the compliance with development conditions (from environmental contamination perspective), DRYU provided the Client with the following environmental consulting services (the "**Services**"):

- Review of planning and regulatory requirements;
- Review of previous environmental investigation reports;
- Supplementary site investigation to delineate areas of environmental concern identified from the previous site investigations and site inspection;
- Assessment of suitable remediation options;
- Review of historical site records and aerial photographs (where available);
- Review of the proposed subdivision and development plan;
- Documentation a Remedial Action Plan for endorsement by the Client and the regulator.

2 Site Description

2.1 Site Location and Identification

General Site details are included below in Table 1, Figure 1 and Appendix 1 – DRYU DSI Sampling and RAP Site Layout.

Table 1 Site Detail

Item	Description
Site Address:	The Site is located at 35-39 Carter Road, Brookvale, NSW
Approximate Site Area:	Around 2050 m^2
Site Identification Details:	Lot 15/12, DP5767; Lot 1, DP 1278077
LGA	Northern Beaches Council
Current Land Use:	The Site is used as E4, General Industrial
Future Land Use:	Mixed use
Zoning	E4, General Industrial
Surrounding Land Uses:	• Industrial properties along the northern, western and southern boundaries • Northern Beaches Secondary College within 150 m in the east • John Fisher Park, Denzil Joyce Oval, Frank Gray Oval within 300 m in the south-east • Greendale Creek within 400 m in the south
Site Co-ordinates:	The centre at 340626.621(E), 6262892.232(N) (CRS GDA94, MGA Zone 56)

2.2 Site Features

From the Site layout shown in Figure 1, site features identified during the Site walkover are summarised below:

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

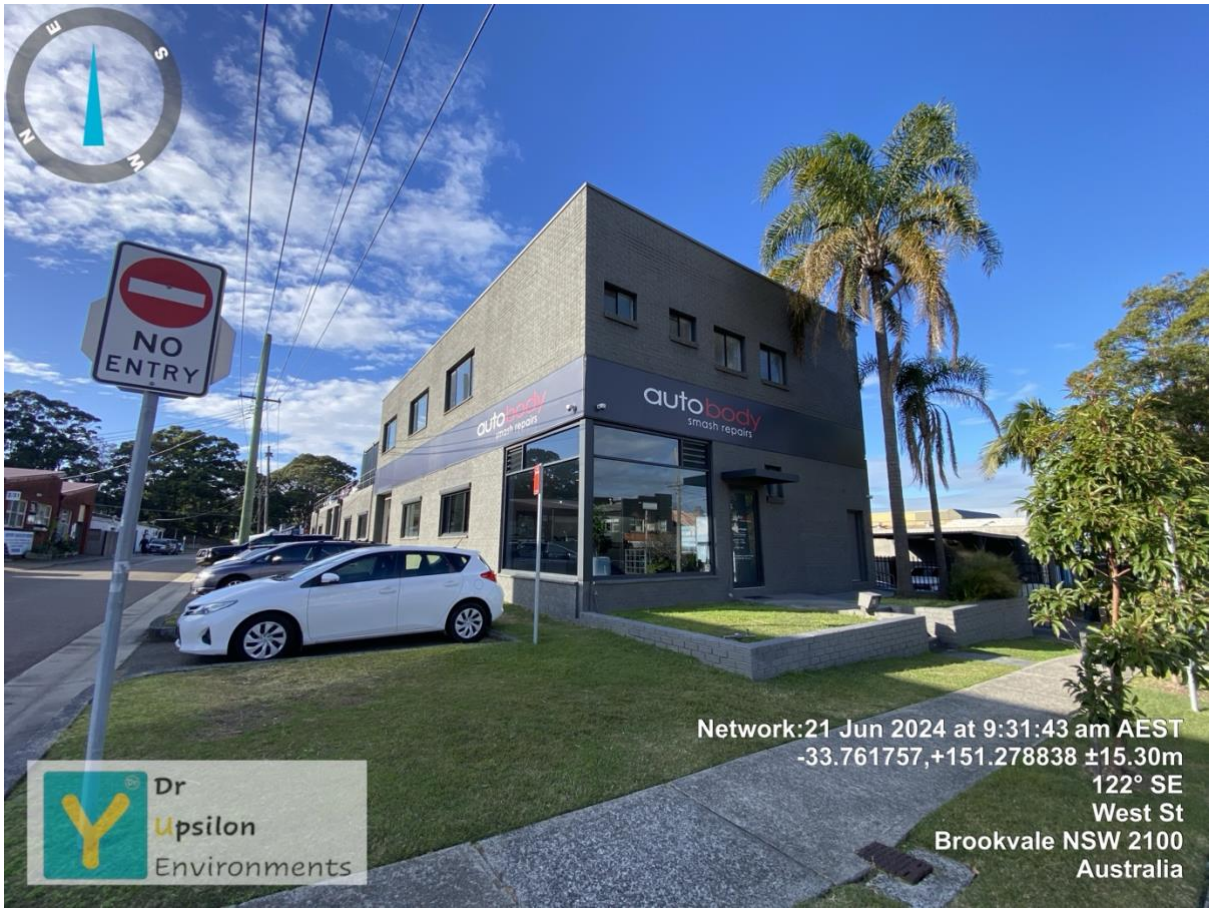


Figure 1 The site at 35-39 Carter Road, Brookvale, NSW

Site features identified during the site walkover are summarised below:

- The site was observed with car body repair and panel paining under good working conditions.
- The site was predominantly covered by hardstand surfaces.
- The site was observed with well-maintained brick structures and colorbond sheeting roof.
- 37 Carter Road, Brookvale had the Super 6 roof removed three years ago.
- The site is accessible from West Street and Carter Road.
- No vegetation stress was observed.
- No evidence of underground storage tank(s) was observed onsite.
- No above ground storage tank(s) was observed.

The observations in surrounding areas were summarised as follows:

- Northern Beaches Secondary College was located at the easterly direction.
- Two petrol stations were observed within 700 m in the upgradient northern direction, while several petrol stations were located at the downgradient in the south.

2.3 Site Topography

Reference to the Sixmap topographic maps 1:25000 indicates that the site slightly slopes from the northern section at around 16 mAHD to 14 mAHD in the southwest.

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

It is expected that Site surface waters would become surface runoff and flow towards the Carter Road drainage.

2.4 Regional Geology and Soils

The Geological Map (https://gmaps.geoscience.nsw.gov.au/100K/Sydney/) indicates that the site is located at Alluvial fan deposits with fluvially deposited quartz-lithic sand, silt, gravel and clay.

According to ESPADE data source (https://www.environment.nsw.gov.au/Salis5app/resources/spade/reports/9130xx.pdf), the landscape features of the site are level plain to hummocky terrain, extensively disturbed by human activity, including complete disturbance, removal or burial of soil. The geology of the site is Artificial fill. Dredged estuarine sand and mud, demolition rubble, industrial and household waste. Also includes rocks and local soil materials.

2.5 Regional Hydrogeology and Local Groundwater Usage

Groundwater beneath the Site is anticipated to be present in a porous, extensive aquifers of low to moderate productivity. Groundwater could flow southern direction towards the creek.

Fourteen groundwater bores were registered within the within 1000 m date buffer of the site (https://realtimedata.waternsw.com.au/water.stm). Twenty-two wells were identified within 2000 m data buffer. Groundwater could be used for monitoring and water supply purposes. The groundwater contamination is unknown as no information could be obtained regarding off-site migration from close proximity (if exist or located at the upgradient of the site to impact the site).

2.6 Acid Sulfate Soils

NSW Planning Industry & Environment resources: https://www.environment.nsw.gov.au/topics/land-and-soil/soil-degradation/acid-sulfate-soils and https://datasets.seed.nsw.gov.au/dataset/acid-sulfate-soils-risk0196c) Acid Sulfate Soil ("**ASS**") Risk Mapping (https://www.environment.nsw.gov.au/eSpade2Webapp#) for the site indicate that the Site is classified as NO known occurrence.

According to the Warringah LEP 2001 (https://eplanningdlprod.blob.core.windows.net/pdfmaps/1800_COM_ASS_010A_010_20110919), the site has no known acid sulfate soils potential.

3 Summary of Previous Site Contamination Investigations and Assessments

3.1 Preliminary Site Investigation Report

The Stage One Preliminary Site Investigation Report (Ref. No.: DRYU412J_PSI_35-39 Carter Road, Brookvale, NSW_01072024, dated 01 July 2024) indicates the following:

- Aerial photographic records indicate that there is no evidence of major landscape change at the site as residential from 1930 to 1971. Since around 1970s, the three residential dwellings were demolished and transformed into industrial land use. In around 1982 to 1986, the middle lawn section of the site was likely transformed into car park for industrial land use. From 1986, the site was no landscape change as industrial land use. In around 2022, the asbestos roof was removed in the middle of the site.

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

- A review of the 'List of NSW Contaminated Sites Notified to the EPA' listed by the NSW EPA identified seven contaminated sites notified to NSW EPA within the 1000-m data buffer. Records of Notice to NSW EPA were not identified within the 1000-m data buffer. However, none of notified sites nor records of notice was recorded onsite. As such, DRYU considers the most adjacent sites within 200 m in the south and south-east could not impact the site significantly via off-site migration. The upgradient petrol stations in the west and north could not be confidently assessed due to lack of information, but all of them are listed as Regulation under CLM Act not required.
- One record of Motor garages/Engineers businesses/or Service Stations was registered on site between 1978~1979. There were many motor mechanics/motor garage businesses registered within the 500 m data buffer in the close proximity from 1950s to present. There could be uncertainty of businesses located at the up-gradient or on immediate surroundings to impact the site via offsite migration.
- The former service stations and dry cleaners from 1950s at the upgradient northern direction were also identified. The former service station may have impacted soil and groundwater beneath the service station and beyond its boundary. Any residual hydrocarbons in groundwater (if present) have less potential to migrate to the upgradient southern direction beneath the subject site as local groundwater flow is inferred to be to the south. If groundwater flow direction in the vicinity of the subject site is south or south-east, it is likely to be impacted by any contaminant in groundwater from the former service station.

Few potential areas of environmental concern were identified at the site, associated with the following:

- Current and historical site uses;
- Importation of uncontrol fill for structure construction.
- A review of historical aerial photographs indicates that former sheds and/or structures were demolished in 1970s. There is uncertainty of potentially buried demolition waste in this area.

3.2 Summary of Detailed Site Investigation Report

The Detailed Site Investigation Report (Ref. No.: DRYU642J_DSI_V1_35-39 Carter Road, Brookvale, NSW_25062025, DRYU, dated 25 June 2025) indicates the following:

- Among eight soil samples from eight borehole locations for asbestos by NEPM gravimetric testing/observation, several fibro-cement fragments over 7 mm in dimensions during onsite sieving were sighted in BH02_0.13-0.5.
- Bonded asbestos was detected in BH01_0.15-0.35 (0.005%w/w below the HSL-D of 0.05%w/w). However, the concentration of bonded asbestos in BH02_0.13-0.5 (0.78%) did exceed the HSL-D (0.05%w/w, bonded).
- Asbestos fine was detected in one soil sample, BH06_0.1-0.3 (0.003%w/w, exceeding the HSL-D of 0.001%w/w).
- The concentrations of the tested contaminants of potential concern including Heavy Metals – Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel and Zinc, Total Recoverable Hydrocarbons (TRHs), Benzene, Toluene, Ethylbenzene, and Xylene (BTEX), Polycyclic Aromatic Hydrocarbons (PAHs), Organophosphorus Pesticides (OPPs), Organochlorine Pesticides (OCPs), Polychlorinated Biphenyl (PCBs) below the laboratory limit of reporting or below the guideline HIL-D values. Carcinogenic PAHs, BaP TEQ <LOR=0 of BH05_0.1-0.25 (2.2 mg/Kg) did not exceed HIL-D (sand) (4 mg/Kg).

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

- The concentrations of petroleum compounds and fractions below the HSL-D & HSL D Commercial/Industrial (F1 and F2, BTEXN) for vapour intrusion, or below the laboratory limit of reporting for Silt/Clay texture, 0 m to <1 m.
- DSI analytical results for nine soil samples collected indicate concentrations of As, Cu, Cr^{III}, DDT, naphthalene, Ni, Pb and Zn were either below the laboratory limit of reporting or below the corresponding guideline values for EIL-Commercial/Industrial. The elevated Pb concentrations in BH04_0.3-0.5 (350 mg/Kg) and BH05_0.1-0.25 (620 mg/Kg) did not exceed the Generic added contaminant limits for Pb (1800 mg/Kg).
- DSI analytical results for nine soil samples indicate concentrations of TPH fractions (F1, F2, F3 and F4), BTEX and Benzo(α)pyrene did not exceed the ESL-Commercial/Industrial values – coarse texture, below the laboratory limit of reporting or not detected, except for BH05_0.1-0.25 with BaP 1.7 mg/Kg (slightly higher than the corresponding ESL-coarse 1.4 mg/Kg).
- DSI analytical results for soil samples collected indicates concentrations of TPH fractions were either below the laboratory limit of reporting or below the guideline values of Management Limits.

3.3 Data Gaps

Based on the previous site investigations and DRYU site inspections, DRYU proposed that, potential contaminants (other than asbestos) were not identified at significant concentration exceeding the site contamination criteria in soil. However, there could be uncertainties and gaps due to site access constraint, which should be addressed in the subsequent remediation, validation and environmental management procedures.

Several data gaps may exist and to be addressed during construction stage:

- Soil beneath the dwelling structures such as the footings, the slab, drainages, etc

Data gap closure works are required to be completed in accordance with sampling requirement outlined in the NSW EPA Sampling Design Guidelines (2022).

4 Conceptual Site Model

Based on the Site history review and Site walkover, an updated CSM has been prepared to outline the frame work for identifying how the site may have become contaminated and how potential receptors may be exposed to contamination either in the present or the future through an assessment of the potential source – pathway – receptor linkage (complete pathway).

The key elements of the preliminary CSM as outlined in NEMP 2013 include:

- Known and potential sources of contamination
- Potential contaminants of concern
- Mechanism of contamination
- Potentially affected media
- Human and ecological receptors
- Potential for migration
- Exposure pathways

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

4.1 Areas of Environmental Concern and Contaminants of Potential Concern

Based on the desktop review and site walkover of the site (potential contamination – landfill, offsite migration), the following potential sources of contamination and associated contaminants of potential concern (COPC) have been identified.

- Uncontrolled Filling: A potential source of contamination is imported contaminated fill or residual demolition waste. It is possible that hazardous building materials such as asbestos and lead paint being a potential issue in surface soils and fill. Various COPC can be associated with filling, such as heavy metals, asbestos, polycyclic aromatic hydrocarbons (PAH), petroleum hydrocarbons, organochlorine pesticides (OCP), polychlorinated biphenyls (PCB), and asbestos.
- Potential contaminants associated with hazardous building materials include Heavy Metals, asbestos and PCBs;
- Heavy metals: As, Cu and Cr from Copper Chrome Arsenate timber treatments;
- Heavy metals: Zn from Zinc Alum sheeting;
- Agricultural use: Organophosphorus Pesticides (OPPs), Organochlorine Pesticides (OCPs).

The main potential receptors of contamination at the site (current and future) are considered to be:

- Site users (residents, visitors);
- Construction works (for the construction of any future development);
- Maintenance workers;
- Adjacent site users;
- Surface water;
- Groundwater;
- Terrestrial and aquatic ecology.

The potential contamination pathways through which the identified receptors could come into contact with contamination are considered to be:

- Ingestion and dermal contact;
- Inhalation of dust;
- Inhalation of landfill and/or volatile vapours;
- Surface water run off;
- Leaching and vertical migration into groundwater;
- Lateral migration of groundwater;
- Contact with terrestrial and aquatic ecology.

4.2 Potential Sources, Pathways and Receptors of Contamination

The potential sources, pathways and receptors of contamination are provided below in Table 2.

Table 2 Potential Sources, Pathways and Receptors of Contamination

Potential Sources	Pathway	Receptor	Comment/Risk Management/Action Recommended
Importation of potentially contaminated fill onsite throughout	Ingestion and dermal contact	Current and future Site users	There is low potential for Site users to come into contact with contaminated soil, therefore a complete pathway potentially does not exist.

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

Potential Sources	Pathway	Receptor	Comment/Risk Management/Action Recommended
	Inhalation of dust and vapours	Current and future Site users and surrounding Site users	There is potential for Site users and surrounding land users to be exposed to dust from the Site, therefore a complete pathway potentially likely exists.
	Leaching of contaminants into ground surface	Soils across the Site	There is low potential for surface and shallow soils to be contaminated as a result of historical Site activities, therefore a complete pathway could less likely exist. Therefore, a complete pathway is not considered to exert a significant impact on the site.
	Leaching of contaminants into groundwater	Groundwater beneath the Site	Given the historical and current Site use, surrounding land uses, groundwater is anticipated to be at depths of >1 m BGL, and groundwater beneath the Site is potentially anticipated to be not contaminated as a result of Site activities. Therefore, a potentially complete pathway is unlikely to exist.
	Surface water runoff	Terrestrial and aquatic ecology	There is low potential for stormwater runoff from the Site to be impacted from soil contamination, which can then impact off-site surface water receptors through stormwater system flow, therefore a complete pathway could not exist.
Potentially hazardous building materials on ground surface and buried below ground surface – around the footprint and in the structures	Ingestion and dermal contact	Current and future Site users	There is low potential for Site users to come into contact with contaminated soil, therefore a complete pathway does not exist.
	Inhalation of dust and vapours	Current and future Site users and surrounding Site users	There is potential for Site users and surrounding land users to be exposed to dust and vapours from the Site, therefore a complete pathway likely exists.
Potentially contaminants offsite migration from day to day industrial operation (mechanic repair)	Ingestion and dermal contact	Current and future Site users	There is less likely for Site users to come into contact with contaminated soil, therefore a complete pathway does not exist.
	Inhalation of dust and vapours	Current and future Site users and surrounding Site users	There is low potential for Site users to be exposed to dust and vapours from the Site, therefore a complete pathway is not considered to potentially exist.
	Leaching of contaminants into ground surface	Soils across the Site	There is less likely that leachate/plume from the upgradient to impact the site subsurface soils as groundwater water could flow towards northern creek, therefore a complete pathway is not considered to impact the site.
	Leaching of contaminants into groundwater	Groundwater beneath the Site	The groundwater level is anticipated to be at the depths of over ~1.0 m BGL. Therefore, a complete pathway is not

Potential Sources	Pathway	Receptor	Comment/Risk Management/Action Recommended
			considered to exert a significant impact on the site.

5 Discussion of Potential Remediation Options and Selection of Preferred Remediation Strategy

5.1 Remediation Objectives

With respect to remediation of the Site, the objectives are to:

- Remove or manage the asbestos contaminated soils from the Site, as shown in Appendix 1 – DRYU DSI Sampling and RAP Site Layout and Table 3.
- Validate the remediation process, including imported fill (if any) and surfaces; and
- Document the validation process.

This section of the RAP outlines the potential remediation options and preferred remediation strategy for the asbestos contaminated fill at the Site only. Management of ACM, should it be uncovered during future earthworks, is covered in the following sections.

5.2 Extent of Remediation

Based on the results of DRYU visual inspections, previous soil characterisation and assessment reports for asbestos in/on soil and other contaminants of environmental concern, the extent of soil contamination is as follows:

- The lateral extent of soils impacted by asbestos is approximately 500 m^2 at the western section, as shown in Appendix 1 – DRYU DSI Sampling and RAP Site Layout, however, the proposed soil disturbance shown in the architectural plans could happen for the whole floor slabs;
- The vertical extent of contaminated soils was considered to be defined as the various depth of from 0.1 m (the hardstand thickness) to up to ~0.5 m below ground level, as shown in Table 3 Approximate RAP Areas, Delineation and Remediation Strategy and Appendix 1 – DRYU DSI Sampling and RAP Site Layout.

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

Table 3 Approximate RAP Areas, Delineation and Remediation Strategy

AEC No.	Positive Sample Locations	Stratum of concern and depth /mBGL	Area /m^2	Approximate Volume /m^3	Notes
Asbestos Impacted Area for the proposed disturbance area (two lift footings and partition wall)					
Western IRAP Area 01~02	BH01_0.15-0.35, BH02_0.13-0.5 and BH06_0.1-0.3	Under slab, up to 0.5 mBGL (refusal)	~500 m^2	~100 m^3	• Medium to high risk and shall be managed according to the WHS regulation • On-site supervision by an Environmental Consultant • Class A asbestos removal; • Air Monitoring and Clearance Certificate required • Excavation for offsite disposal if slab disturbance for lift construction; • Waste classification of spoil

Note:

- Assuming most of the warehouse slab will be retained, only two lift footings and the middle partitional wall could disturb the fill under slab.
- Red sample locations denote where bonded asbestos/asbestos fine were observed or detected.
- Highlighted sample locations (in red) denote where the soils were impacted by bonded asbestos/Asbestos fine, exceeding the adopted SAC.
- Asbestos did not exceed the HSL-D shall be managed according to the WHS legislation.
- These estimated areas, volumes, tonnage numbers are estimated with approximately ±25% deviation with high uncertainty due to shallow bedrock encountered.

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

5.3 Potential Remediation Options

ASC NEPM (2013) outlines the following order of preference (hierarchy of options) for soil remediation and management:

- On-site treatment of the contamination so that it is either destroyed or reduced to an acceptable level;
- Off-site treatment of the contamination so that it is either destroyed or reduced to an acceptable level, after which the soil is returned to the Site;
- Consolidation and isolation of the soil on-site by containment with a properly designed barrier; and
- Removal of the contaminated material to an approved facility, followed by replacement with validated fill as required.

In addition, ASC NEPM notes that, where assessment indicated remediation would have no net environmental benefit or would have a net adverse environmental effect, an appropriate management strategy can be implemented.

With respect to the remediation of asbestos contaminated soils at the Site and in accordance with the ASC NEPM (2013) hierarchy of remediation options, the potential remediation options therefore are:

- On-site immobilisation of the contaminated soils – this process involves injecting chemicals into the contaminated matrix in order to “lock in” or reduce the potential for the contaminants to be released.
- On-site capping and containing of the contaminated soils – this process involves the importation of validated material which is then used to construct a cap over the contaminated soil, so that the potential for future disturbance of the contaminated soil is reduced.
- Excavation and off-site disposal of the contaminated soils – this process involves the physical hand digging and removal of the contaminated soils from the Site, followed by validation sampling. The contaminated soil is disposed of at a lawfully approved facility. If the entire volume of contaminated material is to be hand dug, excavated and removed as one volume, the entire volume would classify as **General Solid Waste (non-putrescible)-Special Waste (Asbestos)**, following a waste classification process for in-situ soil. If the soil with the asbestos contaminated topsoil/fill is to be loaded directly into container with double-sealed asbestos bags for off-site disposal.
- Waste classification reports for spoil (fill and residual soils/rock) will also be required and be prepared by an environmental consultant.

5.4 Rationale for Selection of the Off-site Disposal Strategy

Based on previous contamination investigation and risk assessment, this report addresses the most feasibly remediation option by selecting the offsite disposal option for the proposed small lift footing/partitional wall excavation, in order to achieve net environmental benefit:

- minimisation of public risk;
- minimisation of contaminated soil disturbance;
- minimisation of contaminated material/soil moved to landfill;
- The proposed ground floor shallow to deep cut for construction.

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

Although cost, time, convenience and future owner perception were important considerations, this RAP primarily stated in terms of public and worker protection, especially for the client, future residents and surrounding receptors.

Therefore, DRYU proposes the following an integrated management strategy Section 5.5 ~ Section 5.7:

5.5 Scraping, Excavation and Off-site Disposal of Identified Contaminated Soils From RAP Areas

After segregation of concrete, the selected remediation option for the **RAP Impacted Area (~500 m^2)** with the asbestos-fine impacted soil is to excavate the impacted fill for offsite disposal, in order to manage the risk effectively, to minimise contaminated soil disturbance and to reduce contaminated material/soil moved to landfill. Regardless, this option is considered to be the preferred option for footing excavation.

Emu picking of asbestos is not permitted for impacted soil reuse, where asbestos has been identified as asbestos fines or fibrous asbestos. Removal of asbestos fragments is not a remedial approach to 'clean' asbestos contaminated soils or stockpiles for reuse.

5.6 Scraping, Classification and Off-site Disposal of Fill at Other Areas Rather Than the RAP Areas at the Site

The proposed excavation earthworks for the footings shall scrape the concrete, gravel, recycled aggregate and underlain fill materials.

The spoil from the structure footprints shall be segregated, classified and disposed offsite to an appropriate landfill licensed by NSW EPA to receive the contaminated material. Prior to offsite disposal, excavated materials require waste classification where the results of samples collected from the material are compared to the NSW EPA (2014) Waste Classification Guidelines.

5.7 Excavation, Classification and Off-site Disposal of Natural Soil From the Footings Excavation

For the footing excavation, the underlying natural soil may satisfy the definition of Virgin Excavated Natural Material (VENM) to be re-used offsite for engineered fill or used in earthworks. This can be assessed by an experienced environmental consultant following remediation and removal of fill soils and prior to continuation of footings excavation.

The underlying natural soil from floor pad **excavation** shall be validated and classified to meet the definition of Virgin Excavated Natural Material (VENM) to be re-used offsite for engineered fill. This can be assessed by an experienced environmental consultant following remediation and removal of fill soils and prior to continuation of excavation.

6 Remedial Action Plan

6.1 Overview

The general procedures for remediating asbestos impacted soils at the Site to be implemented by the Client, and its subcontractors, include:

- Preparation of a waste classification report;
- Site establishment;

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

- Excavation and off-site disposal of asbestos contaminated soils from one localised RAP Area;
- Excavation, classification and off-site disposal of spoil from structure footprints, where contamination was not detected or not assessed due to site access constraint;
- Validation sampling and reporting.

These steps are discussed in detail in the sections below. A suitably qualified environmental consultant will be required to oversee each aspect of the remediation works.

6.2 Remedial Works

6.2.1 Contaminated Soils from RAP Areas

In order for the contaminated soils for **RAP Areas** to be disposed of at a waste disposal facility, a waste classification report will need to be prepared. This report should be prepared by a suitably qualified environmental consultant in accordance with the NSW EPA (2014) *Waste Classification Guidelines*.

The results of DRYU soil characterisation assessment reports can be used to prepare the waste classification report for RAP Areas. Should the environmental consultant consider that additional sampling is required to confirm the waste classification, this should be discussed with the Client prior to preparation of the waste classification report.

The procedure that should be followed for the remediation and off-site disposal of contaminated soils is outlined below, as shown in Table 3 and Appendix 1 – DRYU DSI Sampling and RAP Site Layout and Table 3.

- The remedial areas should be marked out with spray paint or similar prior to hand-digging and/or raking and emu-picking.
- The approximate lateral extent (as shown in Appendix 1 – DRYU DSI Sampling and RAP Site Layout) of digging/excavation to be undertaken is as follows:
  - The approximate remediation area excludes the extent of the soils to any underground/ground services facilities
- Excavation in **RAP Areas** is to be extended to either the underlying virgin natural materials, after the removal of fill (average 0.2-thick fill layers, or up to approximately 0.5 m below initial ground surface, from 0.1 mBGL to 0.5 mBGL) or to encounter natural clay before validation and landscaping.
- The contaminated soils are to be temporarily stockpiled on-site away from tree droplines or loaded directly with double-bagged asbestos bag or heavy-duty plastic into waste disposal trucks with waste classification.
- The spoil is to be disposed off-site at a facility licensed to accept the classification of waste that is applied to the material and in accordance with the waste classification report. Based on DRYU visual inspection and previous soil characterisation assessment reports, the following waste classification may apply:
  - Remediation Areas: **RAP Areas** – General Solid Waste (non-putrescible)-Special Waste (Asbestos);
  - If the entire volume of contaminated soil is mixed – Special Waste-Asbestos, General Solid Waste (non-putrescible) with the requirement of waste classification for the stockpile.

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

- If soils are to be stockpiled separately, the materials should be put on top of 2 mm plastic and covered with a layer of high visibility geofabric materials (or equivalent) to prevent airborne dispersion of asbestos fibres. Excavation and movement of all bonded ACM soils are required to be conducted by a **Class A Licensed Asbestos Removalist** Company under the supervision of a suitably qualified Environmental Consultant/Occupational Hygienist (i.e., DRYU). A relevant Asbestos Removal Control Plan ("**ARCP**") should be developed and reviewed for friable asbestos impacted soil report by a Class A asbestos removalist company. The **ARCP** will address the risks associated with ACM and controls to be implemented during works to mitigate the possibility of airborne asbestos exposure to contractors, clients and visitors on Site.
- Waste disposal trucks transporting contaminated soil from the Site are to be covered during transport. Waste disposal documentation should be retained by the Client, or its subcontractors, for each load of contaminated soil leaving the Site in order to verify that the contaminated soils have been appropriately disposed.
- The environmental consultant shall be engaged for onsite supervision works and will be required to keep a photographic record as part of the validation process (refer to Validation Plan of this RAP).

6.2.2 Fill Scraped from All Other Areas Cross the Site (Rather Than RAP Area)

The proposed excavation earthworks for the one-level footings shall scrape the topsoil, gravel and underlain fill materials.

The spoil collected from the structure footprints rather than from the asbestos impacted areas of environmental concern shall be classified and disposed offsite to an appropriate landfill licensed by NSW EPA to receive the material. Prior to offsite disposal, excavated soil requires waste classification where the results of samples collected from the material are compared to the NSW EPA (2014) Waste Classification Guidelines.

6.2.3 Potential Segregation and Resources Recovery of Hardstand Materials

The selected remediation option for **concrete slabs** after visual inspection once they are overturned from the northern section shall be segregated for offsite recycling, if neither asbestos or unusual stain are not observed, in order to manage the risk effectively, to reduce solid waste to landfill. Regardless, this option is considered to be the preferred option.

6.2.4 Potential Segregation and Resources Recovery

The proposed construction with two-level footings will generate large volumes of excess sand requiring offsite disposal. It is important to keep non-impacted materials separated from contaminated soils. Non-impacted fill soils (confirmed through validation sampling) can be either reused onsite or potentially disposed offsite at as General Solid Waste.

The underlying natural soil at this site shall be validated to meet the Resource Recovery Exemption – Excavated Natural Material (ENM) Exemption (2014), thereby fulfilling legislative obligations of the Protection of the Environment Operations (Waste) Regulation 2014.
The underlying natural sand at this site may satisfy the definition of Virgin Excavated Natural Material (VENM) to be re-used offsite for engineered fill or used in earthworks. This can be assessed by an experienced environmental consultant following remediation and removal of

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

fill soils and prior to continuation of footings excavation. Once natural soil and rock is assessed as VENM, it must be kept separate from other material that may be stockpiled onsite.

6.3 Site Establishment

The Client (or its subcontractors) will be required to establish the Site prior to excavation works commencing. The following should be undertaken prior to the excavation works commencing:

- The Site should have delineated areas affected by asbestos and should establish an effective exclusion zone with minimum 10 metre setback, where practical;
- Restrict access to the site from adjacent streets and access ways;
- The Site should be made secure with safety tape bunting, barricades, perimeter fencing, and unauthorised access restricted;
- Appropriate warning signs should be placed at the affected areas. Signs shall be attached at each point of entry, exit and at suitable intervals.
- Site signage, including contact numbers for Site Supervisors should be placed in prominent locations around the Site;
- The Site should have a decontamination area at point or entry and exit with PPE supplies and waste receptacles;
- Temporary stockpile areas (if needed) should be designated away from tree droplines and protected with sediment controls, water spray for dust suppression and or plastic covers;
- Proposed truck and plant movements should be communicated to workers on-site;
- Erosion and sedimentation controls (e.g. silt fences or hay bales) should be installed as needed around the proposed excavation areas, proposed temporary stockpile areas (if needed), around the road drainage inlet screens if exist, and/or around the boundaries of the Site as a minimum;
- Locate services – prior to commencing remedial activities, all services such as power, water, gas sewerage and telecommunications cables shall be identified and where possible disconnected by the contractor.
- Water will be required for dust control and/or cleaning purposes. The waste water should be collected, treated on site or disposed properly.
- During excavation, demolition and construction phases, toilet facilities are to be provided on the work site at the rate of one toilet for every 20 persons or part of 20 persons employed at the site

6.4 Validation of Imported Fill

If material is to be imported for backfilling of excavations (or other reasons), the material must be classified as either VENM, or under a Resource Recovery Exemption, as defined by the NSW EPA. Documentation stating the classification of the material should be provided to the environmental consultant prior to the material being imported, in order for the suitability of the documentation to be verified.

If material to be imported to the Site does not have documentation of its classification, or the documentation provided is considered to be inadequate, the environmental consultant should carry out their own assessment of the material at the source site.

For all material being imported to site, including virgin excavated natural material (VENM) or material subject to a Resource Recovery Order / Exemption (RRO/E), the environmental

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

consultant should conduct its own sampling of material upon its arrival on site in accordance with the recommendations for stockpile sampling provided in the Sampling Design Guidelines (i.e. 1 sample per 25 m^3) to verify the contamination status of the imported material.

6.5 Demobilisation

On completion of the remediation works, the plant and equipment used during the works should be cleaned, validated and inspected with clearance certificates, removed from the Site and signage removed from the fencing around the Site as necessary.

The Site fencing, erosion and sedimentation controls should remain in place until the construction works are completed. This may require temporary maintenance to be carried out on the fencing and sediment controls.

7 Health, Safety and Environmental Management Plan

7.1 Safe Work Method Statements

Prior to commencing work on Site, workers must prepare Safe Work Method Statements ("**SWMS**") for the tasks they will carry out. **SWMS** must be site specific and be reviewed by the relevant workers each time they arrive on Site.

The **SWMS** must describe how the work is to be carried out, the risks applicable to each step, appropriate controls, and the personnel responsible for implementing the controls.

7.2 Personal Protective Equipment

Personal Protective Equipment ("**PPE**") requirements would typically be established by the Client or its Principal Contractor. It is anticipated minimum PPE requirements will include:

- Long sleeve shirts and long pants;
- Hard hat;
- Safety glasses;
- Steel capped boots;
- Cut resistant gloves (overworn with disposable nitrile gloves if handling contaminated soil); and
- High visibility vest or jacket.

Other PPE may be required depending on the activity being undertaken.

PPE must be in date and in suitable condition, and workers must be trained in the effective use of PPE.

7.3 Site Inductions

The Client (or its Principal Contractor) should carry out site inductions for each worker undertaking works on the Site, to setup exclusion zone and decontamination procedure. A Site Induction Register should be maintained on Site.

Each worker should provide evidence of qualifications and training relevant to their duties during the Site induction.

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

7.4 Hours of Operation

The hours of operation for remediation works will be dependent on requirements from Council as well as those from the Client, current residents and children's day care services, though it is anticipated will be in the order of:

- Monday to Friday – 7:00am to 5:00pm;
- Saturday – 8:00am to 12:00noon; and
- Sunday and Public Holidays – no work permitted.
- Emergency work may be permitted outside these hours.
- Excavation or removal of any materials using machinery of any kind, including compressors and jack hammers, must be limited to between 7.30am and 5.00pm Monday to Friday.

7.5 Site Access

Site access is to be restricted to those personnel inducted and carrying works out on the Site. No public access should be provided throughout the course of the remediation works.

Vehicular access to the Site should be restricted to those vehicles required to undertake works on Site. Other vehicles (including personal vehicles) should be parked in suitable locations off-site.

A tyre grid or washdown bay should be installed at the entry gates to the Site. Plant and vehicles entering and exiting the Site should enter through the tyre grid or washdown bay in order to reduce the potential for soils to be tracked off-site. Driveways and nearby stormwater drains should be regularly inspected and excess soil removed. **Soil or other materials are not to be washed into stormwater drains or towards the creek**.

7.6 Stockpile Management

Based on the remediation works outlined in this RAP, DRYU considers there is likely to be little requirement for the stockpiling of soils. Stockpiling is likely to be limited to temporarily stockpiling of excavated soils prior to disposal or temporary stockpiling of imported fill prior to being used to backfill excavations (if required).

If temporary stockpiling is required, the stockpiles should be placed in a designated area, surrounded by sediment controls (silt fences or hay bales), out of tree drop line areas. Stockpiles should not exceed the height of the fencing on the Site boundary. If stockpiles are to be left overnight, they should be covered prior to the end of the working day with plastic sheeting to reduce the potential for dust generation overnight.

If stockpiles of contaminated material are required during remediation works, the footprint of the stockpile area must be validated following removal of the stockpiles to demonstrate contamination from the stockpiles has not occurred.

7.7 Noise and Vibration

It is anticipated that noise and vibration levels during remediation works will not exceed that of a typical construction site. Noise and vibration levels can be managed through:

- Only undertaking works within the specified work hours;
- Ensuing plant and equipment undertaking work is in good order; and
- Placement of acoustic barriers around the perimeter of the Site.

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

If excessive noise or vibration levels are generated, consideration may be given to implementing a noise or vibration monitoring program.

7.8 Dust Management

There is a likelihood of dust being generated during the works, mainly through handling of soil and plant and vehicles tracking over the Site.

Personnel will be required to monitor dust levels throughout the remediation works, and wet down the work areas with mist sprays as necessary. Care should be taken to avoid saturation of soils in order to reduce runoff potential.

7.9 Odour Management

Given the nature of the soil contamination previously identified, odours are not considered to be a potential issue. However, if odours are encountered, potential management options include application of odour suppressants and covering of soils.

7.10 Flora and Fauna

The proposed remediation area covers only open space, where trees should neither be removed or damaged.

A Construction Environmental Management Plan by a subcontractor is to include procedures for the clearance of vegetation (if required). This should include:

- Strategies for minimising vegetation clearance within the worksite and protection of vegetated areas adjoining the work area.
- Stockpiles and other materials are not to be stored below the dripline of any tree.

7.11 Material Transport and Tracking

Excavated material being transported from the Site for off-site disposal should be transported in designated trucks with loads covered.

Each load of excavated material removed from the Site should be accompanied by a waste disposal docket, verifying that the load was disposed of at a suitable waste disposal facility licensed to accept the classification waste applicable to the material. The Client (or its Principal contractor) should retain these dockets as part of the Site validation process. These dockets must be made available to the environmental consultant upon request.

Material imported to the Site (e.g. validated fill) should also be transported in designated trucks with loads covered. Imported material should be unloaded in a designated area. Traffic control may be arranged to co-ordinate truck movements into and out of the Site.

Each load of imported material should be accompanied by a delivery docket. The Client (or its Principal contractor) should retain these dockets as part of the Site validation process. These dockets must be made available to the environmental consultant upon request.

Appropriate road rules and NSW legislation apply to vehicles transporting material to and from the Site. In addition, in accordance with the *NSW Protection of the Environment Operations (Waste) Regulation, 2014*, Part 6, Clause 71, states:

"A person must not, in the course of business, transport by motor vehicle any waste that is generated in New South Wales (other than restricted solid waste) to any place, in or outside

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

of New South Wales, unless the place can lawfully be used for the disposal of that waste and one of the following applies:

- the place is 150 kilometres or less from the premises of origin of that waste; and
- the place is more than 150 kilometres from the premises of origin and is the closest or second closest to those premises of the places, in or outside New South Wales, that can lawfully be used for the disposal of that waste.

However, the person can also transport the waste to another State or a Territory if a border crossing to that State or Territory:

- is 150 kilometres or less from the premises of origin; and
- or is more than 150 kilometres from the premises of origin and is closer to those premises than the closest or second closest to those premises of the places in New South Wales that can lawfully be used for the disposal of that waste."

8 Validation Plan

8.1 Data Quality Objectives

The validation plan for the remediation works is based on the seven-step Data Quality Objective ("**DQO**") process outlined in ASC NEPM (2013). These steps are discussed in the sections below.

Step 1 – State the Problem

The Client is proposing to remediate the asbestos impacted soil on the Site for footing construction. Asbestos was identified at one localised area at the Site, at RAP Area with asbestos fine below the ASC NEPM (2013) HSL-D for the Mixed use (commercial / industrial) land use.

Remediation and validation of the Site is therefore required for the Site to be suitable for the future Mixed use (commercial / industrial) land use.

The ACM contamination with data gap identified is addressed through the Remedial Works provided in of this RAP.

Step 2 – Identify the Decisions

The following decisions are required to be made during the validation works:

- Have the localised remediation areas been remediated to a level that all contaminated materials have been excavated and disposed off-site in a legal manner and to render the site suitable for the future setting – Mixed use (commercial / industrial) landuse?
- Have the other areas of the site been classified and validated with sufficient validation sampling and staging requirement to accommodate the excavation of fill materials across the whole site?
- Has the material to be excavated and removed from the Site been suitably waste classified to enable off-site disposal?
- Has imported fill (if required) been suitably validated prior to being imported to Site?
- Are there ongoing environmental monitoring and maintenance requirements for the Site following remediation?

Step 3 – Identify Inputs to the Decisions

The inputs to the decisions are:

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

- Physical observations made during the remediation activities;
- Waste classification reports for the contaminated material to be removed from the Site;
- Waste disposal documentation for contaminated soils removed from the targeted remediation areas;
- Waste classification reports for the fill material to be removed from the other areas across the Site;
- Material tracking documentation for imported fill and off-site disposal;
- Material classification reports for imported fill and off-site disposal;
- Soil analytical data from validation samples collected from excavations across the site including the targeted Remediation Area.
- For areas where excavation works are not planned, such as the landscape areas in the southwestern section of the site and south-western shrub area, an asbestos clearance certificate should be obtained from an LAA to validate these portions of the site.

Step 4 – Define the Site Boundaries
The lateral and vertical extent of impacted soils at RAP Area is shown as Asbestos Impacted **RAP Areas**, in Appendix 1 – DRYU DSI Sampling and RAP Site Layout and in Table 3.

The vertical extent of contamination based on DRYU visual inspection and soil characterisation assessment report is considered to be the depth of the fill layer (approximately up to ~0.5 m BGL in RAP Areas).

The RAP areas shall be validated to demonstrate that the targeted remediation areas are sufficiently remediated.

Step 5 – Develop a Decision Rule

8.1.1.1 Remediation Validation Criteria

Remediation validation sampling will be carried out across each remediation/excavation area to confirm that the asbestos contaminated materials have been removed from the Site and the remaining excavated areas are free of contaminated soils and fill.

The results of the validation sample analysis should be compared to the following criteria:

- NEPC (2013) National Environment Protection (Assessment of Site Contamination Measure) Measure 1999 (2013 amendment).

ASC NEPM (2013) define an 'Investigation Level' ("**IL**") as *"the concentration of a contaminant above which further appropriate investigation and evaluation will be required. The investigation and evaluation are to ascertain:*

- the typical and extreme concentrations of the contaminant(s) on the Site;
- the horizontal and vertical distribution of the contaminant(s) on the Site;
- the physio-chemical form(s) of the contaminant(s); and
- the bioavailability of the contaminant(s)."

Soil ILs are to be adopted for validation purposes to confirm that the contaminated soils have been removed from the Site, and the resulting excavations have been remediated.

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

As the contaminants of concern associated in soils and surfaces with this project is Asbestos, application of other Health Investigation levels ("**HILs**") or Ecological Screening Levels ("**ESLs**") are not considered relevant to this project for targeted remediation areas.

Therefore, the adopted criteria for validation of remediation areas at this Site is: Asbestos, as listed in Table 4.

Table 4 Health Screening Levels for Asbestos Contamination in Soil (NEPM 2013)

Form of asbestos	Health Screening Level (w/w)
	Industrial D
Bonded ACM	0.05%
FA and AF (friable asbestos)	0.001%
All forms of asbestos	No visible asbestos for surface soil

8.1.1.2 Imported Fill Validation Criteria

Validation sampling of material to be imported to Site should be required. the environmental consultant should inspect the material upon its arrival to site to verify it matches the description and conditions of the associated classification report. For material imported to site subject to an RRO/E, the environmental consultant should conduct its own sampling of material upon its arrival on site in accordance with the recommendations for stockpile sampling provided in the Sampling Design Guidelines (i.e. 1 in 25 m^3) to verify the contamination status of the imported material. If sampling of fill is required, the results of the sample analysis should be compared to the following criteria:

- VENM – no published criteria exist. The environmental consultant will need to use their judgement to assess if the results of the sampling indicate likely background conditions or otherwise.
- Other Recovered Resource – as per the criteria of the relevant Resource Recovery Order published by the NSW EPA.

8.1.1.3 Quality Assurance / Quality Control

A Quality Assurance / Quality Control ("**QA/QC**") program (if chemicals of environmental concern is considered to be necessarily conducted during validation investigation) should be established in order to assess the quality of the data obtained.

Validation of the remediation works for asbestos impacted soil will be conducted through visual observations made by the environmental consultant, supported by sample analytical results and other documentation as relevant.

Step 6 – Specify Limits on Decision Errors

Specific limits for this project are in accordance with the:

- Appropriate guidance from the NSW EPA and ASC NEPM (2013); and
- Appropriate DQIs, and standard procedures for field sampling and handling.

This step examines the certainty of conclusive statements based on the available Site data collected. This should include the following points to quantify tolerable limits on decision errors:

- Based on a probability that 95% of the data will satisfy the given site acceptance criteria. This follows the guidance given in the NSW EPA Guidelines for the NSW Site Auditor

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

Scheme (3rd Edition), 2017 and the ASC NEPM (2013). Therefore, a limit on the decision error will be 5% that a conclusive statement may be incorrect;
- No individual sample result should have a concentration that exceeds 250% of the Site acceptance criteria;
- A normal distribution will only be used if the coefficient of variance is not greater than 1.2; and
- The standard deviation of a sample population should not exceed 50% of the Site acceptance criteria.

Step 7 – Optimise the Design for Obtaining Data

8.1.1.4 General

Validation of the remediation works will be achieved through on-site visual clearance inspections and validation sampling.

The environmental consultant will be required to be on-site throughout the duration of the excavation works, to ensure the remediation works undertaken are compliant with this RAP. A photographic record should be maintained by the environmental consultant throughout the remediation works. Site photographs should also be collected before and after the remediation works are undertaken.

The environmental consultant should also maintain written records throughout the remediation program, including the date and time of remediation works, the activities being undertaken on the Site (including sampling undertaken), and any items to be actioned.

8.1.1.5 Validation of Excavations From the Remediation Area

Validation of excavations after fill materials removal for offsite disposal from the remediation areas should be undertaken in accordance with the following steps:
- Validation samples should be collected from each excavation at a rate of:
    - One sample per 25 m^2 across the base of each excavation; and
    - One sample per 10 lineal metres per wall of each excavation.
- Validation samples should be collected by machinery or with suitable hand tools. Should the excavations be unsafe to enter (e.g. due to depth or stability), samples should be collected by the excavator (samples should be retrieved from the excavator bucket with care taken to avoid cross-contamination of samples).
- Each sample should be placed into appropriate laboratory-supplied glass jars.
- A clean pair of disposable nitrile gloves should be worn when collecting each sample.
- If hand tools are to be used to collect the samples (e.g. shovels or hand trowels), the equipment should be decontaminated between samples by rinsing with phosphate-free detergent and potable water.
- Samples should be placed into secure containers for transport to the laboratory.
- The samples should be dispatched under Chain of Custody conditions to a National Association of Testing Authorities, Australia ("**NATA**") accredited laboratory for analysis.
- Each validation sample should be analysed for asbestos.
- Given that asbestos is the primary contaminant of concern driving remediation, following the excavation and removal of asbestos contaminated material, a clearance

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

certificate from a Licensed Asbestos Assessor (LAA) must be obtained as evidence of validation of the excavated area.

8.1.1.6 Validation of Imported Fill

If sampling of fill to be imported to Site is required, the following steps should be followed:

- Sampling of the material should be carried out at the source site, before the material is imported to Site.
- If the material is to be classified as VENM, sampling should be undertaken at a rate of one sample per 25 m^3 per source site of material to be imported, with a minimum of three samples collected from each source site.
- If the material is to be classified under a Resource Recovery Order published by the NSW EPA, sampling must be carried out in accordance with that Resource Recovery Order.
- Each sample should be collected by hand or by using stainless steel hand trowels or shovels. Each sample should be placed into appropriate sample containers applicable for the laboratory analysis to be undertaken.
- A clean pair of disposable nitrile gloves should be worn when collecting each sample.
- If equipment is used to collect the samples (e.g. shovels or hand trowels), the equipment should be decontaminated between samples by rinsing with phosphate-free detergent and potable water.
- Samples should be placed into ice-chilled containers for transport to the laboratory.
- The samples should be dispatched under Chain of Custody conditions to a NATA-accredited laboratory for analysis.
- If the material is to be classified as VENM, each sample should be analysed for:
  - Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc);
  - Total Recoverable Hydrocarbons ("**TRH**");
  - Benzene, Toluene, Ethylbenzene and Xylenes ("**BTEX**");
  - Polycyclic Aromatic Hydrocarbons ("**PAH**");
  - Organochlorine Pesticides ("**OCP**");
  - Polychlorinated Biphenyls ("**PCB**"); and
  - Asbestos.
- If the material is to be classified under a Resource Recovery Order published by the NSW EPA, the samples will need to be analysed for the contaminants listed in the respective Resource Recovery Order.

8.2 Validation Reporting

At the completion of the remediation works, a Validation Report will need to be prepared by the environmental consultant. The report should be prepared in accordance with the NSW EPA (2020) Guidelines for Consultants Reporting on Contaminated Sites, ASC NEPM (2013), and other references as relevant.

The Validation Report should include:

- A description of the Site and regional setting;
- Summaries of previous assessments undertaken;

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

- Details of the remediation works undertaken (including photographs);
- Demonstration that the objectives of this RAP have been achieved;
- The results of excavation validation sampling undertaken;
- The results of surface validation sampling undertaken;
- The results of any validation sampling undertaken of material proposed to be imported;
- Documentation, including material tracking information and imported fill certification (if required);
- A statement that the Site is suitable for the proposed land use, including any ongoing monitoring and maintenance requirements if relevant;
- Given that asbestos is the primary contaminant of concern driving remediation, following the excavation and removal of asbestos contaminated material, a clearance certificate from a Licensed Asbestos Assessor ("LAA") must be obtained as evidence of validation of the excavated area. For areas where excavation works are not planned, such as the landscape area in the southwestern section of the site, a clearance certificate should be obtained from an LAA to validate this portion of the site. Clearance certificates should be included as part of the validation data set included in the validation report;
- For areas where excavation works are not planned, such as the landscape area in the south-eastern section of the site, a clearance certificate should be obtained from an LAA to validate this portion of the site;
- Clearance certificates for all of the **Remediation Area** should be included as part of the validation data set included in the validation report;

9 Contingency Plan for Unexpected Finds Protocol

While the investigation, remediation and validation for the Remediation Areas of the site shall render the areas suitable for the proposed commercial land use, there are uncertainty of contaminants of potential concern for fill layer(s) across the whole site. The Unexpected Finds Protocol deals specifically with the construction and related earthworks for the whole lot. A protocol for managing unexpected finds should be developed for the project in conjunction with a Site Environmental Management Plan.

Should a work activity identify any condition other than what can be expected for the groundwater, based on previously identified contaminants in the DSI report, all works shall stop in that area. Unexpected finds are to be immediately reported to the Site Manager.

If any suspect materials (identified by unusual staining, odour, discolouration or inclusions such as building rubble, asbestos sheets/pieces/pipes, ash material, excessive groundwater seepage, settling, running sands, etc.) or any potentially contaminated area(s) and filled area(s), all works will be stopped in the area and further analysis may need be undertaken by a suitably qualified and competent person (i.e., DRYU). Works will not commence until the relevant investigation has been conducted and approval has been received. Unexpected Finds shall be addressed in compliance with the client's Unexpected Finds Protocol.

Considering asbestos in the form of both bonded and asbestos fine from the three remediation areas, there is uncertainty of potential asbestos contamination in fill material across or at some

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

areas of the lot. An unexpected finds protocol shall be prepared and implemented during the fill materials excavation for off-site disposal.

The general unexpected finds protocol shall be implemented as follows:

- Immediately cease work and contact site foreman
- Site Manager to evacuate immediate area and construct temporary barricading to prevent worker access to the unexpected substance(s) and install appropriate stormwater/sediment controls
- Project Manager to notify the Principal's Authorised Person of the discovery and comply with all the directions of the Principal's Authorised Person or its nominee; and
- Photograph the find and mark the identified location using GPS
- If substance assessed as presenting an unacceptable risk to human health evacuate site
- If substance assessed as not presenting an unacceptable risk to human health, Site foreman to retain safety barricades and environmental controls and continue work outside of vicinity
- Project Manager to notify the client's management and engage specialist consultants as required
- Toolbox to all site staff
- Environmental consultant to supervise remediation and undertake validation/clearance as per the remediation/validation/clearance plan
- Work is not to recommence until and investigation has been completed by a suitably qualified person in accordance with the EPA guidelines and directed to do so by the Project Manager.
- Site Foreman to remove barricades and environmental controls and continue work once approval has been given to do so.
- Environmental consultant to submit assessment/validation/clearance reports to Project Manager for distribution to the Client and appropriate regulatory authorities.

Table 5 outlines the management plan for unexpected finds throughout the remediation works:

Table 5 Contingency Plan for Unexpected Finds

Unexpected Find	**Management Plan**
Other potential contamination (e.g. asbestos, stained soil) is identified in surface soils	Stop work in the area of the unexpected find and report to Site Supervisor. Environmental consultant to inspect area provide advice, including potentially collecting samples of the impacted area for analysis. If suspected ACM is identified, the AMP should be reviewed.
potential contamination (e.g. asbestos) is identified in surface soils from other areas across the site rather than form the identified Remediation Areas 01 ~ 02	Stop work in the area of the unexpected find and report to Site Supervisor.

	Environmental consultant to inspect area provide advice, including potentially collecting samples of the impacted area for analysis. If suspected ACM is identified, the AMP should be reviewed.
Contamination is identified in imported fill	Stockpile the contaminated fill on Site and report to Site Supervisor. Environmental consultant may undertake sampling of the suspected contamination, or the Site Supervisor may contact the supplier to arrange for the material to be removed from the Site.
Imported fill not consistent with material classification report	Stockpile fill on Site and contact supplier to confirm the source of the material. Environmental consultant may collect additional samples to confirm the classification of the material.
Other unexpected finds	Stop work in the area of the unexpected find, isolate and contact Site Supervisor. Site Supervisor to identify appropriate management, in consultation (as required) with other personnel.

10 Regulatory Approvals

Chapter 4 of the State Environmental Planning Policy (Resilience and Hazards) 2021 states the following:

4.8 Category 1 remediation work: work needing consent
For the purposes of this Chapter, a category 1 remediation work is a remediation work (not being a work to which section 4.11(b) applies) that is—
(a) designated development, or
(b) carried out or to be carried out on land declared to be a critical habitat, or
(c) likely to have a significant effect on a critical habitat or a threatened species, population or ecological community, or
(d) development for which another State environmental planning policy or a regional environmental plan requires development consent, or
(e) carried out or to be carried out in an area or zone to which any classifications to the following effect apply under an environmental planning instrument—
(i) coastal protection,
(ii) conservation or heritage conservation,
(iii) habitat area, habitat protection area, habitat or wildlife corridor,
(iv) environment protection,
(v) escarpment, escarpment protection or escarpment preservation,
(vi) floodway,
(vii) littoral rainforest,
(viii) nature reserve,
(ix) scenic area or scenic protection,
(x) wetland, or

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

(f) carried out or to be carried out on any land in a manner that does not comply with a policy made under the contaminated land planning guidelines by the council for any local government area in which the land is situated (or if the land is within the unincorporated area, the Minister).
Note—
See section 5A of the *Environmental Planning and Assessment Act 1979* for the factors to be taken into account in assessing whether there is likely to be a significant effect as referred to in paragraph (c) above. The terms used in that paragraph are defined in that Act by reference to both the *Threatened Species Conservation Act 1995* and the *Fisheries Management Act 1994*.

4.9 Consent authority in relation to remediation works

(1) The consent authority in relation to a development application for consent to carry out a remediation work is—

(a) the person or authority that, in accordance with a provision made by an environmental planning instrument that applies to the land, is the consent authority for the development, or

(b) in default of any such provision—

(i) the council for the local government area in which the land is situated, or

(ii) the Minister, if the land is within the unincorporated area.

4.11 Category 2 remediation work: work not needing consent

For the purposes of this Chapter, a category 2 remediation work is—

(a) a remediation work that is not a work of a kind described in section 4.8(a)–(f), or

(b) a remediation work (whether or not it is a work of a kind described in section 4.8(a)–(f)) that -

(i) by the terms of a remediation order, is required to be commenced before the expiry of the usual period under the *Contaminated Land Management Act 1997* for lodgment of an appeal against the order, or

Note -

The usual period for lodgement of an appeal is 21 days or a period prescribed instead by regulations made under the *Contaminated Land Management Act 1997*.

(ii) may be carried out without consent under another State environmental planning policy or a regional environmental plan (as referred to in section 4.16(4)), or

(iii) is carried out or to be carried out by or on behalf of the Director-General of the Department of Agriculture on land contaminated by the use of a cattle dip under a program implemented in accordance with the recommendations or advice of the Board of Tick Control under Part 2 of the *Stock Diseases Act 1923*, or

(iv) is carried out or to be carried out under the Public Land Remediation Program administered by the Broken Hill Environmental Lead Centre.

4.12 Remediation work that is ancillary to other development

(1) A remediation work that would of itself be a category 2 remediation work but which is ancillary to designated development that requires development consent may, as an applicant chooses -

(a) be made part of the subject of the development application for the designated development instead of being made the subject of a separate development application, or

(b) be treated as a category 2 remediation work.

(2) However, a category 1 remediation work must be treated as such even if it is ancillary to development that may be carried out without consent.

(3) A remediation work that would of itself be a category 1 remediation work and constitute designated development does not, just because it is ancillary to other development—

(a) render the latter development designated development, or

(b) cause that development to become a development for which development consent is required.

4.13 Prior notice of category 2 remediation work

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

(1) A person who proposes to carry out a category 2 remediation work on any land must give notice of the proposed work to the council for the local government area in which the land is situated (or, if the land is within the unincorporated area, to the Minister).
(2) The notice must be given -
(a) at least 30 days before the commencement of the work, except in the case of a work referred to in section 4.11(b), and
(b) in the case of a work referred to in section 4.11(b)—no later than the day before the commencement of the work.
(3) The notice must -
(a) be in writing, and
(b) provide the name, address and telephone number of the person who has the duty of ensuring that the notice is given, and
(c) briefly describe the remediation work, and
(d) show why the person considers that the work is category 2 remediation work by reference to sections 4.8, 4.11 and (if it applies) 4.12(1), and
(e) specify, by reference to its property description and street address (if any), the land on which the work is to be carried out, and
(f) provide a map of the location of the land, and
(g) provide estimates of the dates for the commencement and completion of the work.

4.14 Guidelines and notices: all remediation work

(1) All remediation work must, in addition to complying with any requirement under the Act or any other law, be carried out in accordance with—
(a) the contaminated land planning guidelines, and
(b) the guidelines (if any) in force under the *Contaminated Land Management Act 1997*, and
(c) in the case of a category 1 remediation work—a plan of remediation, as approved by the consent authority, prepared in accordance with the contaminated land planning guidelines.
(2) A notice of completion of remediation work on any land must be given to the council for the local government area in which the land is situated (or, if the land is within the unincorporated area, to the Minister).
(3) The notice is to be given within 30 days after the completion of the work.
(4) A copy of the notice must also be given within the same period to the consent authority, if consent was required for the remediation work and the consent authority is not one of the authorities referred to in subsection (2).

4.15 Notice of completion of remediation work

The notice required by section 4.14(2) must—
(a) be in writing prepared and signed by the person who carried out the work, and
(b) provide the person's name, address and business telephone number, and
(c) provide details of the person's qualifications to carry out the work, and
(d) specify, by reference to its property description and street address (if any), the land on which the work was carried out, and
(e) provide a map of the location of the land, and
(f) state when the work was completed, and
(g) specify the uses of the land, and the substances, that contaminated it in such a way as to present a risk of harm to human health or some other aspect of the environment, and
(h) specify the uses of the land immediately before the work started, and
(i) briefly describe the method of remediation used in the work, and
(j) specify the guidelines that were complied with in the work, and
(k) specify the standard of remediation achieved (in the light of the use proposed for the land), and
(l) show in what manner the work (if a category 1 remediation work) complied with the conditions of the relevant development consent, and

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

(m) state what action must be maintained in relation to the land after the completion of the remediation work if the standard of remediation achieved is to be maintained.
Note—
A site audit statement (within the meaning of Part 4 of the *Contaminated Land Management Act 1997*) may be given in partial compliance with this requirement.

Therefore, the proposed remediation works for the RAP Area do not require Category 1 consent. Instead, the proposed remediation works are considered to be Category 2 Remediation Works. This requires:

- At least 30 days' notice to be provided to Council prior to the commencement of remediation works; and
- Notice of the completion of remediation works to be provided to Council within 30 days of the completion of works.

The licensed asbestos removalist must give written *Notification* of *asbestos removal* work to *SafeWork NSW* to notify of asbestos removal under the WHS Regulation. The licensed asbestos removalist must give written notice to SafeWork NSW at least five calendar days before removal work is commenced.

*Interstate asbestos removalists operating in NSW must notify SafeWork NSW. Where asbestos must be removed immediately, the licensed asbestos removalist must telephone SafeWork NSW on 13 10 50 and complete and submit this form within 24 hours of the telephone notification.

Immediate removal of asbestos may be commenced if:

- There is a sudden and unexpected event, including a failure of equipment that may cause persons to be exposed to respirable asbestos fibres
- An unexpected breakdown that requires immediate rectification to enable the service to continue.

11 Reporting Requirements

11.1 Clearance Certificate(s) and Control Air Monitoring

Progressive Clearance Certificates with control air monitoring shall be required at key milestones throughout the works for:

- Clearance certificate prior to entry to any portion of a removal site without asbestos PPE or any non-asbestos removal works;
- Clearance certificates required for plant & equipment prior to leaving the site or commencing non-asbestos works;
- Clearance certificate required for the RAP Area, all landscaping areas without excavation, all other areas across the site with fill throughout.

It is important to note that the Asbestos Assessor has the right to stop the project if work is not being carried out in accordance with the site specific agreed procedures identified in this RAP and/or ARCP.

11.2 Validation Report

A final validation report is required to be prepared in accordance with The Guidelines for Consultants reporting on contaminated Land: Contaminated land guidelines (NSW EPA) and

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

submitted to the regulator for endorsement. The validation report shall document the remediation methods and results to ensure that the objectives stated in the RAP have been achieved. The report must confirm statistically that the remediated site complies with the clean-up criteria set for the site. Where targets have not been achieved, reasons must be stated and additional site work proposed to achieve the remediation goals outlined in this RAP, or a management plan recommended for ongoing monitoring. The validation report should also include information confirming that all other regulatory authorities' licence conditions and approvals have been met. In particular, documentary evidence is needed to confirm that any disposal of soil off-site has been undertaken in accordance with this RAP.

11.3 Consultation and Communication

Prior to the commencement of remediation works, the Client (or its Principal Contractor) should provide written advice of the works to adjoining site occupants and others who may be affected by the works. This can be in the form of a letterbox drop or public announcement.

Any complaints or issues raised from adjoining site users (or other members of the public) during the works should be immediately reported to the Site Supervisor, who should then investigate the complaint or issue and remedy as is applicable.

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

12 Limitations

Overview
Contaminated site investigations are generally designed based on a number of factors:

- Objective and scope of works;
- State and national guidelines;
- Accessibility/ site restrictions;
- Visual and Olfactory observations;
- Historical land use; and
- Proposed land use.

Investigation designs can also be influenced by the following factors:

- Stage of a development process;
- Purpose of the investigation (due diligence, environmental compliance etc.);
- Available budget;
- Client's risk management strategy; and
- Available timescale.

Although the investigation is designed to identify and/or delineate potential contamination there are a number of uncertainties that can result in additional investigative work, increased remedial work and costs, re-development delays and changes in land values. These uncertainties are an inherent part of dealing with land contamination. This section is designed to outline some of the uncertainties and limitations that are generally encountered.

Document Preparation
DRYU has prepared this report for the purpose set out in **Section 1** and as agreed to by the Client. DRYU cannot be held responsible to the Client and/or others for any matters outside the agreed scope of services. Any advice, opinions or recommendations are considered current to the date of this document.

No warranties or guarantees are expressed or should be inferred by any third parties. This document may not be relied upon by other parties without written consent from DRYU. Where consent is provided, other parties should review the scope of service, objectives and limitation to determine if the document is appropriate for their requirements. They should make their own enquiries and obtain independent advice to determine the accuracy and appropriateness of this report for their use and interpretation.

It should be understood that where this document has been developed for a specific purpose, for example a due diligence document for a property vendor, it may not be suitable for other purposes such as satisfying the needs of a purchaser or assessing contamination risks for classifying the site.

Scope of Services
For each scope of services, a specific approach to the assessment is developed. The scope is usually driven by key objectives set by the client's needs and refined based on the project/site specific requirements.

Any data, evaluations, discussions, conclusions and/or options presented have been designed, obtained and presented based on the Scope of services. Should the instructions provided be

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

inaccurate, insufficient or incomplete the document outcomes could change. The scope of services may also be limited by factors such as time, budget, access, site constraints and/or reliance third party data and information made available to DRYU.

Reliance on Data

This document has been prepared by DRYU with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with the Client. Information documented herein is based on the interpretation of data collected (data, surveys, analyses, designs, plans and other information), which has been accepted in good faith as being accurate and valid at the time of writing the document.

It should be noted that many investigations are based upon an assessment of potentially contaminating processes which may have occurred historically on the site. This assessment is based upon historical records associated with the site. Such records may be inaccurate, absent or contradictory. In addition, documents may exist which are not readily available for public viewing.

Except where it has been stated in this document, DRYU has not verified the accuracy or completeness of the data relied upon. Statements, opinions, facts, information, conclusions and/or recommendations made in this document ("conclusions") are based in whole or part on the data obtained, those conclusions are contingent upon the accuracy and completeness of the data. DRYU cannot be held liable should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to DRYU leading to incorrect conclusions.

Report Separation

This report has been prepared using all the data provided (within the report and within its appendices/attachments. Any reliance upon this report should assess and review the report in its entirety. The executive summary, individual sections and/or appendices/attachments should not be cut out and/or removed from the report and used independently.

Report logs, figures, laboratory data, drawings, etc. are generated for this report by DRYU consultants (unless otherwise stated) based on their individual interpretation of the site conditions at the time the site visit was undertaken. Although DRYU consultants undergo training to achieve a standard of field reporting, individual interpretation still varies slightly. Information should not under any circumstances be redrawn for inclusion in other documents or separated from this report in any way.

Environmental Conclusions

In accordance with the scope of services, DRYU may have conducted environmental field monitoring and/or testing in the preparation of this report. The nature and extent of monitoring and/or testing conducted is described in the report.

DRYU has utilised state and national guidelines, Australian Standards, professional judgement and a degree of skill and care to develop standard operating procedures (SOP), which are considered to be in line with industry best practice. Any monitoring, testing, sampling and report preparation has been undertaken in accordance with DRYU's SOP and performed in a professional manner.

All sites have varying degrees of heterogeneity in the vertical and lateral soil and groundwater horizons. No monitoring, common testing or sampling techniques can eliminate the possibility

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

that monitoring or testing results/samples are not totally representative of soil and/or groundwater conditions encountered.

The sampling results obtained are therefore representative of the conditions at the point at which the sample was taken. Additional data derived from indirect field measurements and sometimes other reports may also be used in the interpretation of environmental conditions. However, the environmental field monitoring and/or testing are merely indicative of the environmental conditions of the site at the time samples were taken. Any evaluations, discussions and conclusions are based on the data results presented. No liability can be accepted for changes in ground conditions in between exploratory locations (bore holes/test pits etc.). It should also be recognised that site conditions, including the extent and concentration of contaminants, can change with time.

Other Limitations
DRYU's interpretations are based upon its professional judgement, experience, and training. These opinions are also based upon data derived from testing and analysis described in this document. DRYU believes that its opinions, options, conclusions and/or recommendations are reasonably supported by the testing and analysis that have been done, and that those opinions have been developed according to the professional standard of care for the environment consulting profession in this area at this time. That standard of care may change and new methods and practices of exploration, testing, analysis and remediation may develop in the future, which might produce different results. DRYU's professional opinions contained in this document may be subject to modification if additional information is obtained, through further investigation, observations, or validation testing and analysis during remedial activities.

Should events or emergent circumstances or facts become apparent after the submissions date of the report, DRYU cannot be held liable to update or reverse the report to take this into account.

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

13 References

- Protection of the Environment Operations Act 1997 (Cth.).
- Protection of the Environment Operations (Waste) Regulation 2014 (Cth.)
- NSW State Environmental Planning Policy (Resilience and Hazards) 2021
- National Environment Protection (Assessment of Site Contamination) Measure 1999 – 2013 Amendment (NEPC, 2013, referred to as the "ASC NEPM")
- Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997 (NSW EPA, 2015; referred to as the 'Duty to Report Guidelines')
- Consultants Reporting on Contaminated Land: Contaminated Land Guidelines (NSW EPA, 2020, referred to as the "Consultant reporting Guidelines")
- Sampling Design Part 1 – Application: Contaminated Land Guidelines (NSW EPA, 2022, referred to as the "Sampling Design Guidelines")
- NSW EPA (2022) Sampling Design Part 2 – Interpretation: Contaminated Land Guidelines (NSW EPA, 2022, referred to as the "Sampling Design Guidelines");
- Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (The WA Department of Health, 2021, referred to as the "WA Asbestos Guideline")
- New South Wales Environment Protection Authority. (2014). Waste Classification Guidelines - Part 1: Classifying Waste. Sydney, Australia (NSW EPA, 2014, referred to as the "Waste Classification Guideline").

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

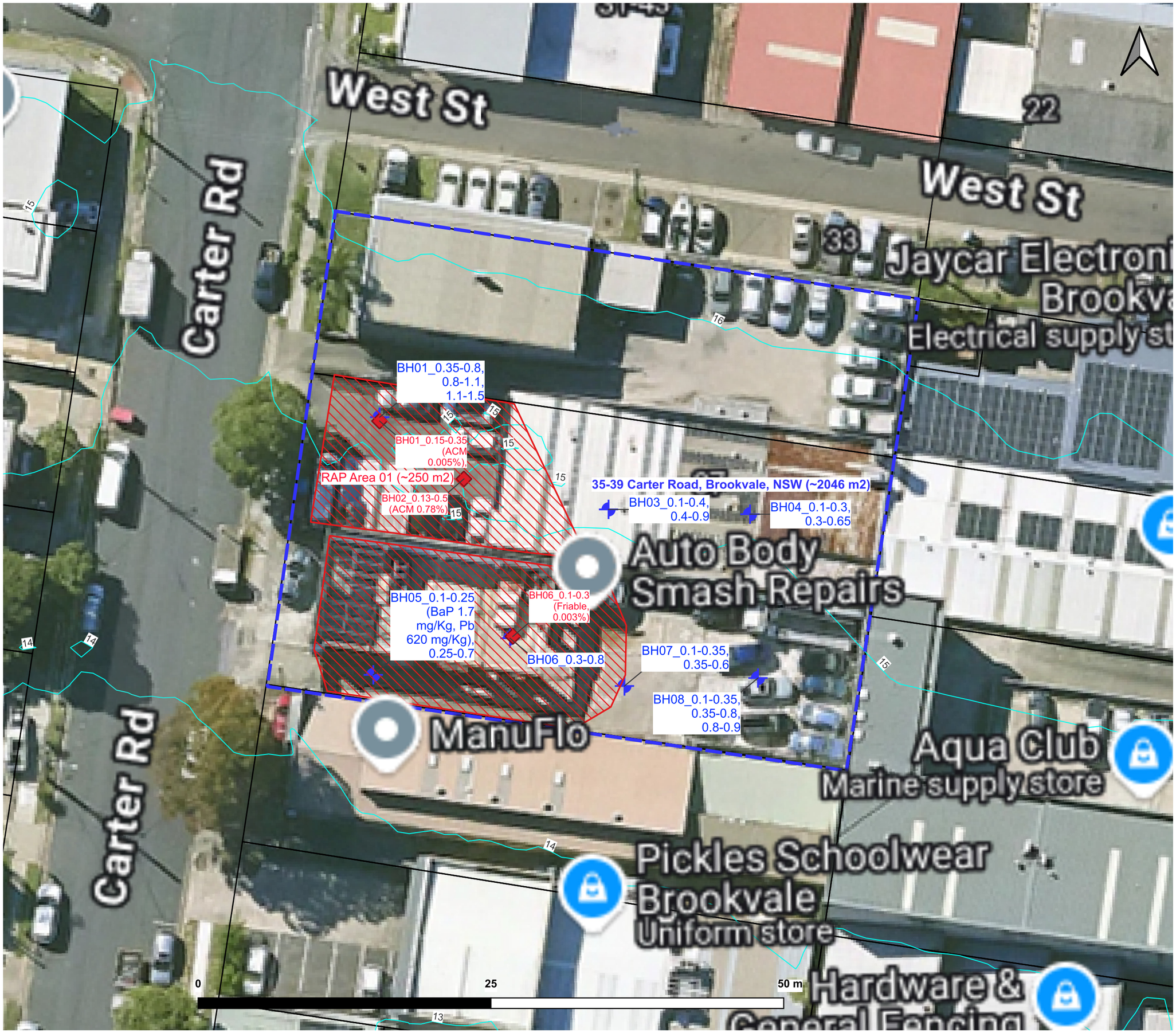
14 Appendices

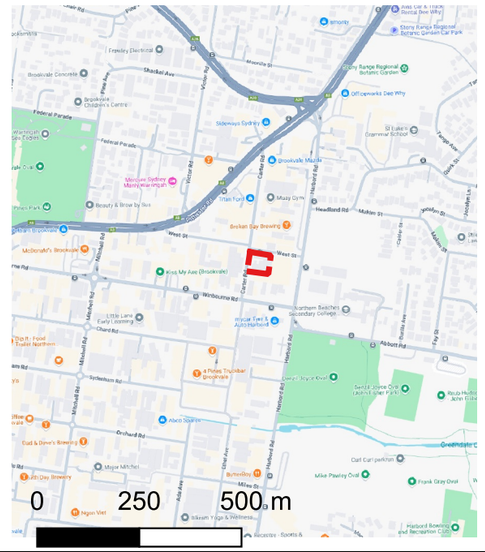
Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

Appendix 1 – DRYU DSI Sampling and RAP Site Layout

Dr Upsilon Environments Pty Ltd
ABN: 91 647 732 518
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
PO Box 289, Kingsford, NSW
Web: www.DrUpsilonGroup.com.au

Figure 2 Site Layout and DSI Investigation Sampling





Dr Upsilon Environments

Legend

- Positive Asb
- Sampling
- RAP Area
- Site
- 1 m Contour

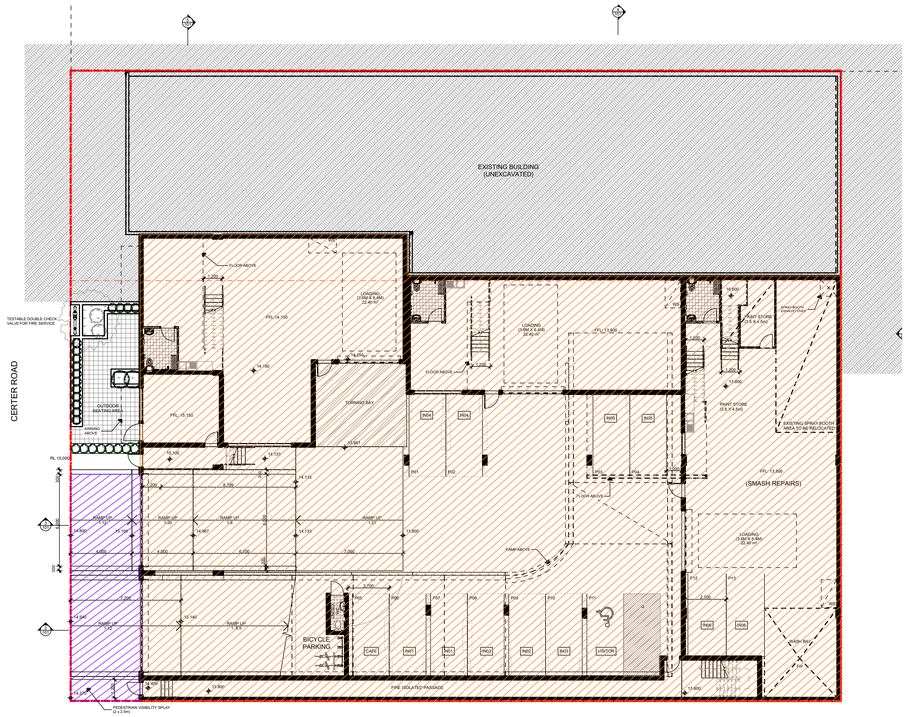
Project No.:	DRYU655J		
Fig No.	1	Ver.	1
Drafted by	JY	Date	12/07/2025
CRS:	GDA96 MGA Zone 56		

Figure description

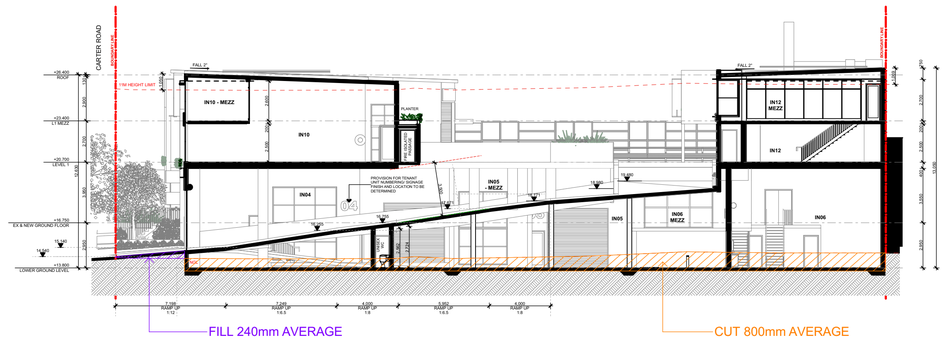
RAP at 35-39 Carter Road, Brookvale, NSW

Appendix 2 – Architectural Plan and Survey Plan

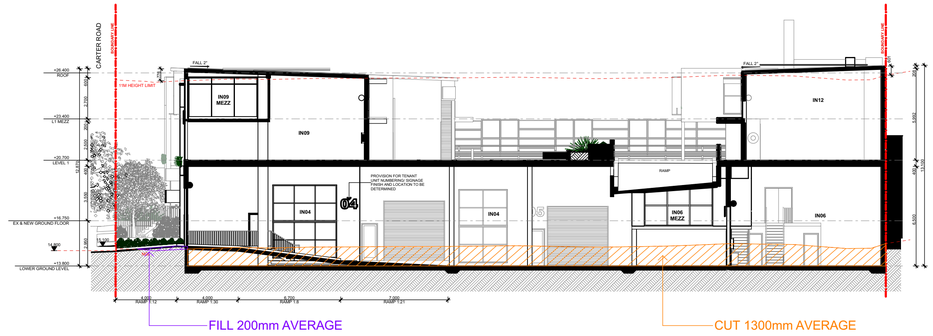
REV	DATE	DESCRIPTION
A	18/12/2024	ISSUED FOR DA



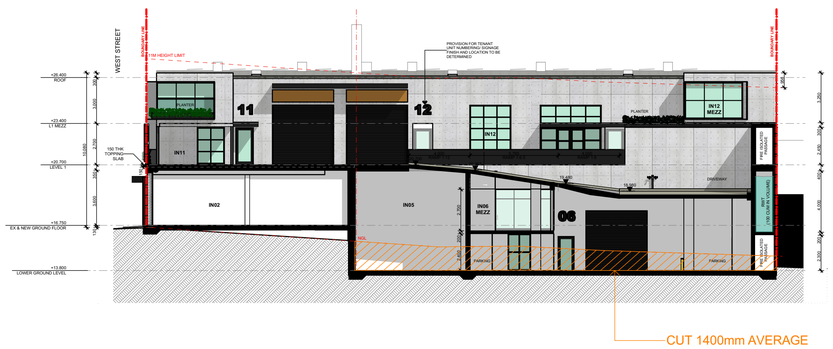
1 - CUT & FILL PLAN 1:200



2 - CUT AND FILL PLAN - SECTION A



3 - CUT AND FILL PLAN - SECTION B



4 - CUT AND FILL PLAN - SECTION C

5 - CUT AND FILL PLAN - SECTION D

LEGENDS:

EXCAVATION CUT

INFILL

LEGEND	
B	BOLLARD
CM	CONVEX MIRROR AS PER TRAFFIC ENGINEER'S REPORT
DB	DISTRIBUTION BOARD
DFH	DUEL FIRE HYDRANT
DP	DOWN PIPE
	DEMOLITION
	EASEMENT
EV.	ELECTRONIC VEHICLE CHARGING STATION
EX.	EXISTING
+XX.XX	EXISTING LEVEL
	FALL TO FLOOR WASTE
FC	FIBRE CEMENT SHEETING
FG	FIXED GLASS
FFL	FINISHED FLOOR LEVEL
FH	FIRE HYDRANT
FHR	FIRE HOSE REEL
FS-X	FIRE STAIR NUMBER
FW	FLOOR WASTE
HWU	HOT WATER UNIT
MRS	METAL ROOF SHEETING
MSB	MAIN SWITCH BOARD
MC	METAL CLADDING
NBN	NATIONAL BROADBAND NETWORK
NGL	NATURAL GROUND LEVEL
SC	STRUCTURAL COLUMN AS PER ENGINEER'S DETAIL
SFL	STRUCTURAL FLOOR LEVEL
SM	SEWER MAN HOLE
SP	SPANDREL PANEL
ST	STORAGE
SWP	STORMWATER PIT
TRS	TRANSLUCENT ROOF SHEETING
VC	PHOTOVOLTAIC CELL SYSTEM
VP	VENT PIPE
WC	WATER CLOSET
W/S	WASTE STORAGE

FIGGIS + JEFFERSON TEPA ARCHITECTS

FIGGIS + JEFFERSON TEPA PTY LTD
Suite 203, 70-76 Alexander St | CROWS NEST NSW 2065

E studio@figgis.com.au T 02 9438 5555
W www.figgis.com.au

Nominated Architect:
Jeffrey Chan NSW ARB No. 10967

PROJECT
BROOKVALE INDUSTRIAL

FOR
AVAKIAN HOLDINGS (NSW) PTY LTD

AT
35-39 CARTER STREET BROOKVALE NSW 2100

DRAWING TITLE
CUT AND FILL PLAN

ARCHITECT
JC

DRAWN
CL

NOT FOR CONSTRUCTION

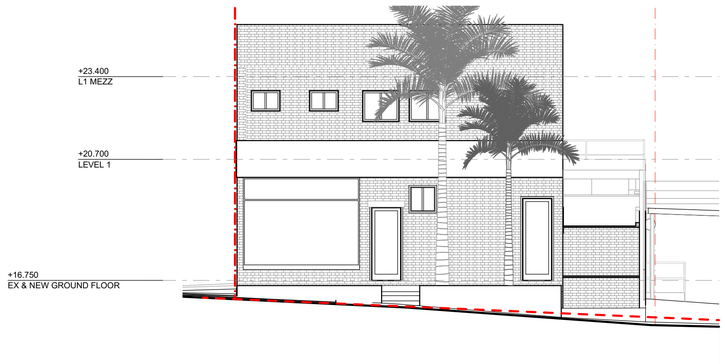
TRUE NORTH

DRAWING NO. 3857 DA 101

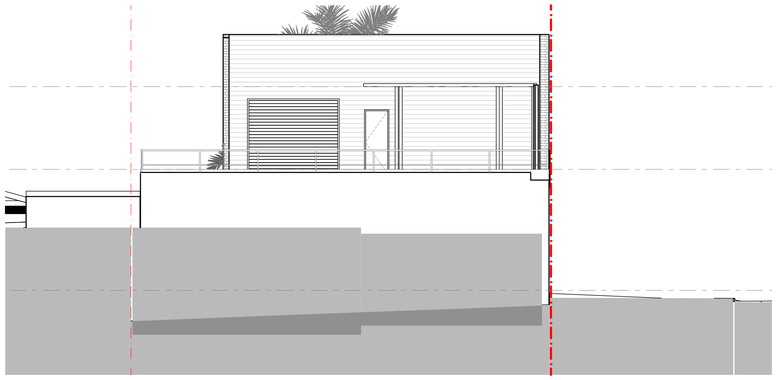
ISSUE A

SCALE 0m

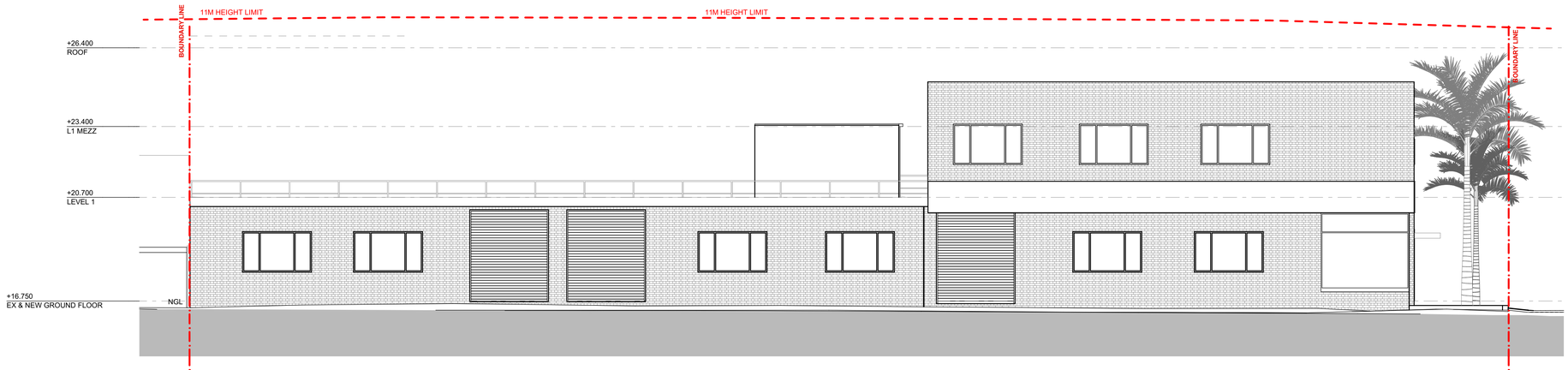
REV	DATE	DESCRIPTION
A	18/12/2024	ISSUED FOR DA



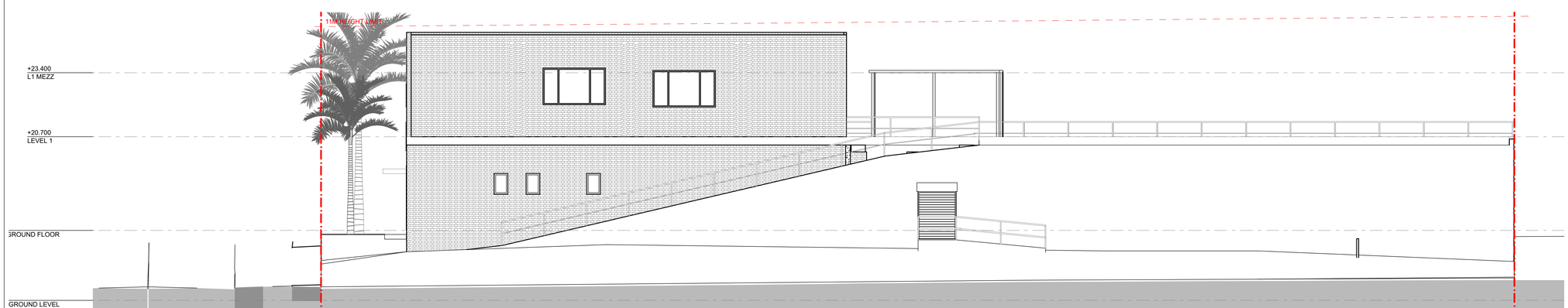
1 / - WEST ELEVATION (EXISTING)
1:100



2 / - EAST ELEVATION (EXISTING)
1:100



3 / - NORTH ELEVATION (EXISTING)
1:100



4 / - SOUTH ELEVATION (EXISTING)
1:100

LEGEND	
B	BOLLARD
CM	CONVEX MIRROR AS PER TRAFFIC ENGINEER'S REPORT
DB	DISTRIBUTION BOARD
DFH	DUEL FIRE HYDRANT
DP	DOWN PIPE
	DEMOLITION
	EASEMENT
EV.	ELECTRONIC VEHICLE CHARGING STATION
EX.	EXISTING
+XX.XX	EXISTING LEVEL
	FALL TO FLOOR WASTE
FC	FIBRE CEMENT SHEETING
FG	FIXED GLASS
FFL	FINISHED FLOOR LEVEL
FH	FIRE HYDRANT
FHR	FIRE HOSE REEL
FS-X	FIRE STAIR NUMBER
FW	FLOOR WASTE
HWU	HOT WATER UNIT
MRS	METAL ROOF SHEETING
MSB	MAIN SWITCH BOARD
MC	METAL CLADDING
NBN	NATIONAL BROADBAND NETWORK
NGL	NATURAL GROUND LEVEL
SC	STRUCTURAL COLUMN AS PER ENGINEER'S DETAIL
SFL	STRUCTURAL FLOOR LEVEL
SM	SEWER MAN HOLE
SP	SPANDREL PANEL
ST	STORAGE
SWP	STORMWATER PIT
TRS	TRANSLUCENT ROOF SHEETING
VC	PHOTOVOLTAIC CELL SYSTEM
VP	VENT PIPE
WC	WATER CLOSET
W/S	WASTE STORAGE

FIGGIS + JEFFERSON TEPA ARCHITECTS

FIGGIS + JEFFERSON TEPA PTY LTD
Suite 203, 70-76 Alexander St | CROWS NEST NSW 2065

E studio@figgis.com.au T 02 9438 5555
W www.figgis.com.au

Nominated Architect:
Jeffrey Chan NSW ARB No. 10967

PROJECT
BROOKVALE INDUSTRIAL

FOR
AVAKIAN HOLDINGS (NSW) PTY LTD

AT
35-39 CARTER STREET BROOKVALE NSW 2100

DRAWING TITLE
EXISTING ELEVATIONS

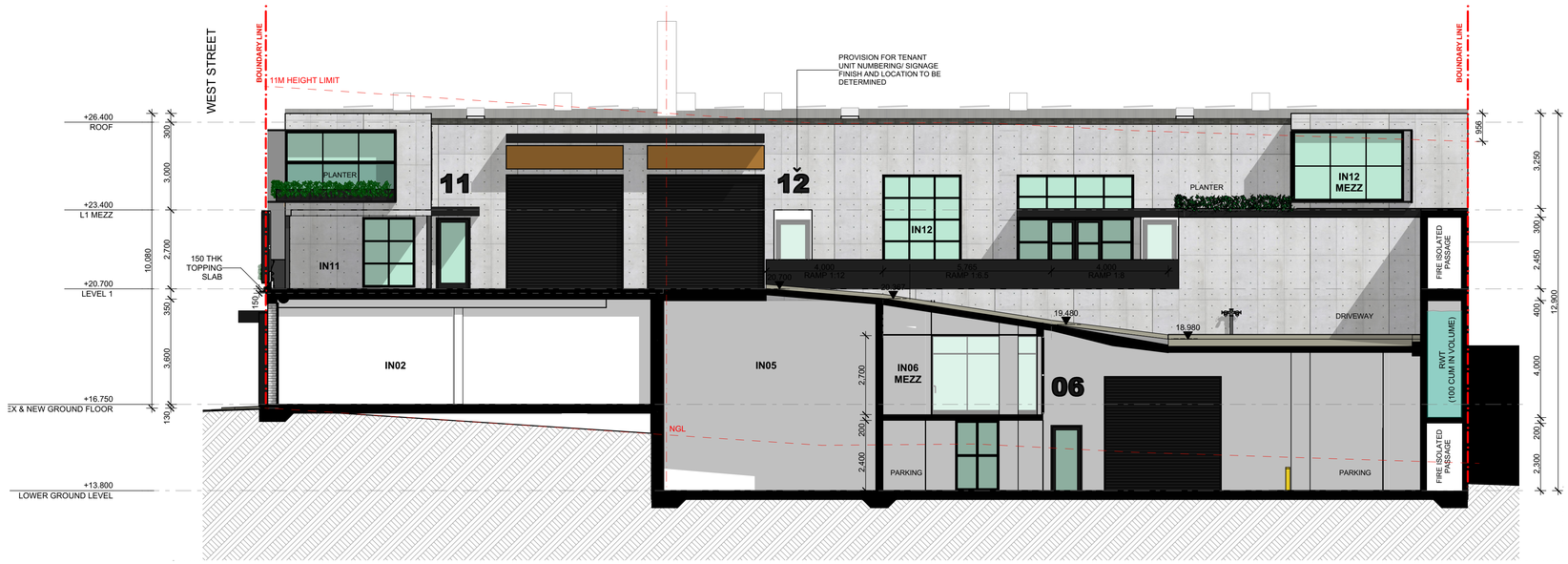
ARCHITECT JC
DRAWN CL

NOT FOR CONSTRUCTION

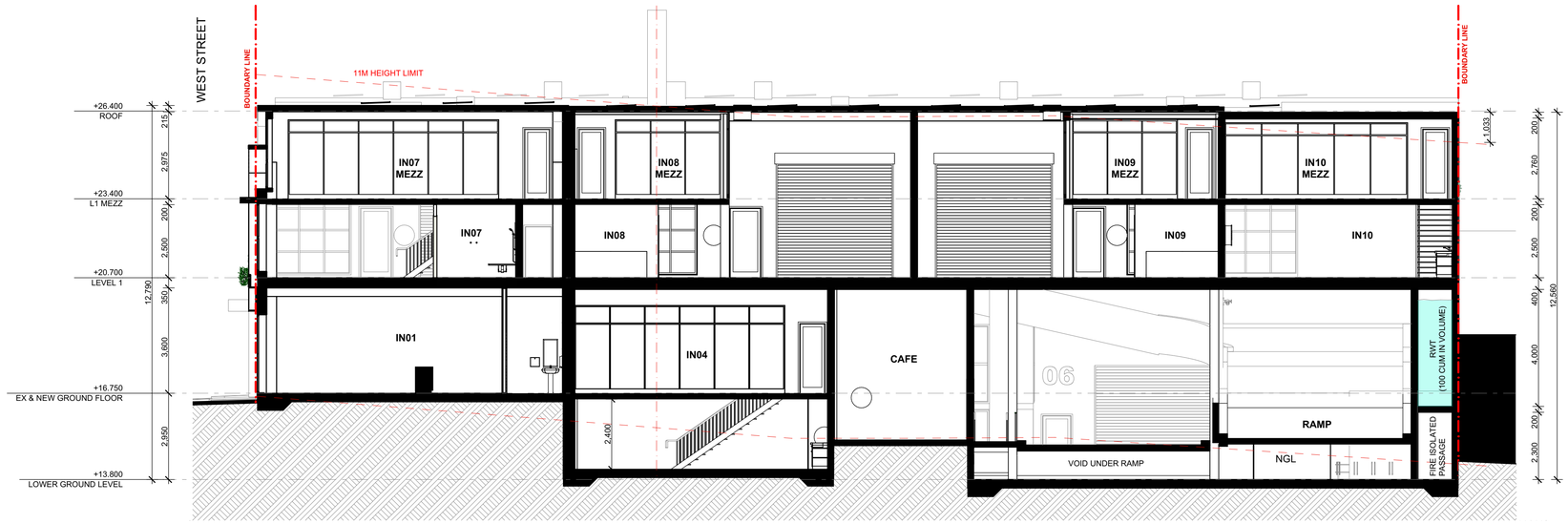
TRUE NORTH

DRAWING NO. 3857 DA 200
ISSUE A

SCALE 0m



1 - SECTION C
1:100



2 - SECTION D
1:100

REV	DATE	DESCRIPTION
A	18/12/2024	ISSUED FOR DA

LEGEND	
B	BOLLARD
CM	CONVEX MIRROR AS PER TRAFFIC ENGINEER'S REPORT
DB	DISTRIBUTION BOARD
DFH	DUEL FIRE HYDRANT
DP	DOWN PIPE
	DEMOLITION
	EASEMENT
EV.	ELECTRONIC VEHICLE CHARGING STATION
EX.	EXISTING
+XX.XX	EXISTING LEVEL
	FALL TO FLOOR WASTE
FC	FIBRE CEMENT SHEETING
FG	FIXED GLASS
FFL	FINISHED FLOOR LEVEL
FH	FIRE HYDRANT
FHR	FIRE HOSE REEL
FS-X	FIRE STAIR NUMBER
FW	FLOOR WASTE
HWU	HOT WATER UNIT
MRS	METAL ROOF SHEETING
MSB	MAIN SWITCH BOARD
MC	METAL CLADDING
NBN	NATIONAL BROADBAND NETWORK
NGL	NATURAL GROUND LEVEL
SC	STRUCTURAL COLUMN AS PER ENGINEER'S DETAIL
SFL	STRUCTURAL FLOOR LEVEL
SM	SEWER MAN HOLE
SP	SPANDREL PANEL
ST	STORAGE
SWP	STORMWATER PIT
TRS	TRANSLUCENT ROOF SHEETING
VC	PHOTOVOLTAIC CELL SYSTEM
VP	VENT PIPE
WC	WATER CLOSET
W/S	WASTE STORAGE

FIGGIS + JEFFERSON TEPA ARCHITECTS

FIGGIS + JEFFERSON TEPA PTY LTD
Suite 203, 70-76 Alexander St | CROWS NEST NSW 2065

E studio@figgis.com.au T 02 9438 5555
W www.figgis.com.au

Nominated Architect
Jeffrey Chan NSW ARB No. 10967

PROJECT
BROOKVALE INDUSTRIAL

FOR
AVAKIAN HOLDINGS (NSW) PTY LTD

AT
35-39 CARTER STREET BROOKVALE NSW 2100

DRAWING TITLE
SECTIONS (2)

ARCHITECT
JC

DRAWN
CL

NOT FOR CONSTRUCTION

TRUE NORTH

DRAWING NO. 3857 DA 301

ISSUE A

SCALE 0m

How to Contact Us

DR UPSILON ENVIRONMENTS PTY LTD
ABN: 91 647 732 518
PO Box 289, Kingsford, NSW
Phone: 0406 201 136
Email: Jeffrey.yu@DrUpsilonGroup.com
Web: www.DrUpsilonGroup.com.au