Remediation Action Plan

445-459 Canterbury Road, Campsie NSW

NE30028

Prepared for

Hailiang Property Group Pty Ltd

13 May 2021

Cardno

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Document Information

Prepared for	Hailiang Property Group Pty Ltd
Project Name	445-459 Canterbury Road, Campsie NSW
File Reference	NE30028-R003-RAP-RevB.docx
Job Reference	NE30028
Date	13 May 2021
Version Number	B

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Effective Date	13/05/2021
Date Approved	13/05/2021

Document History

Version	Effective Date	Description of Revision	Prepared by	Reviewed by
A	19/04/2021	Internal Draft	C. Cook	
B	13/05/2021	External Draft	C. Cook	D. Hanvey

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1 Introduction

Cardno was been engaged by HPG Australia Pty Ltd (HPG) to prepare a Remediation Action Plan (RAP) for their site located at 445-459 Canterbury Road, Campsie NSW (the site). HPG intends to develop the site from the current mixed commercial land-use to a private hospital with two basement parking levels. It is Cardno's understanding that the RAP has been requested by Canterbury-Bankstown Council (Council) to demonstrate that the site can be made suitable for the proposed development. Cardno understands that Melissa Porter of Senversa Pty Ltd has been engaged as the NSW Environment Protection Authority (EPA) accredited Site Auditor for the project.

Existing investigations on the site have included a Preliminary Site Investigation (PSI) (Trace, 2014), Detailed Site Investigation (DSI) (Cardno, 2017) and Data Gap Investigation (DGI) (Cardno, 2021). In consideration of the findings of both these investigations, the DGI made the following conclusions with regard to contamination identified on the site:

> *Based on the findings of this report* [the DGI]*, there are no complete SPR linkages that would indicate human health risk to current and future site users however given the presence of metals, benzo(a)pyrene and TRHs exceeding the adopted ecological criteria, there is potential for a complete SPR linkage to impact future ecological receptors if impacted material is retained onsite.*

The following recommendations were made to address residual data gaps and ensure appropriate construction of the proposed development with regards to contamination:

- *Complete Stage 2 and Stage 3 as outlined and approved in the Sampling Analysis and Quality Plan (SAQP)* (Cardno, 2020).
  - *Stage 2: Assessment of soils within the existing structure footprint and additional sampling to clarify waste classification of previous locations.*
    - *Additional monitoring from wells installed on the northern boundary to confirm or identify change in TRH detections. Care should be taken during demolition to not disturb or damage these wells.*
    - *From the findings of this investigation a Remediation Action Plan (RAP) or other excavation guidance may also be prepared.*
  - *Stage 3: Consulting and environmental support during construction to ensure that materials are managed for offsite disposal as per excavation guidance and classifications. Further visual and sampling assessment of unexpected finds and final excavation surfaces may also be made to confirm site suitability.*

In light of the of the residual data gaps this RAP should be considered preliminary and subject to update following completion of the above noted Stage 2 assessment.

1.1 Proposed development

The proposed redevelopment includes the construction of a private hospital facility on the site with basement parking. From a review of the proposed Concept Design (**Appendix B**) and in discussion with HPG it is understood that the footprint of the planned structure is to be boxed out to RL 18.645 m Australian Height Datum (AHD) or a depth of between 6 and 9 metres below ground level to accommodate basement parking. Remaining on-grade areas will include a small park and laneway on the northern boundary and landscaped areas east, south and west.

1.2 Objectives

The objective of the RAP is to evaluate various remedial options to recommend the most appropriate remedial strategies to render the site suitable for the proposed land use.

Additionally, the RAP will include measures to minimise the potential risks to human health and the environment during implementation of the remedial works and under the proposed future land use.

1.3 Scope of work

The preparation of this RAP included the following scope of work:

- Review of previously prepared site reports to review and identify:
  - Site features and extents;
  - A conceptual site model (CSM); and
  - What further assessment, if any, is required.
- Propose and evaluate options for remediation and recommend the preferred remediation strategy;
- Detail the implementation of the preferred remediation strategy including:
  - Identifying legislative, planning and permitting requirements;
  - Develop a Construction and Waste Management Plan outlining environmental controls required for the duration of the remediation works and to be implemented alongside the existing Construction Environmental Management Plan (CEMP);
  - Identify environmental, site, occupational health and safety (OHS) control measures and community consultation requirements associated with implementation of the preferred remedial strategy;
- Preparation of this Remediation Action Plan document outlining the above.

1.4 Guidelines and Legislation

This RAP and the remediation and validation requirements were completed in accordance with the requirements included in the following guidelines and legislation:

- CRC Care (2017) Technical Report No. 39 Risk-based management and remediation guidance for benzo(a)pyrene, January 2017 (CRC-Care 2017)
- NEPC (1999) National Environment Protection (Assessment of Site Contamination) Measure (NEPM). National Environment Protection Council (NEPC) 1999, Amendment 2013 (NEPC 2013)
- NSW Department of Urban Affairs and Planning (1998) Managing Land Contamination: Planning Guidelines: SEPP 55 Remediation of Land, 1998 (SEPP 55)
- NSW EPA (1995) Contaminated Sites Sampling Design Guidelines. New South Wales Environment Protection Authority, September 1995 (EPA 1995)
- NSW EPA (2014) Waste Classification Guidelines. Part 1: Classifying Waste (EPA 2014).
- NSW EPA (2017) Guidelines for the NSW Auditor Scheme (3rd edition). New South Wales Environment Protection Authority, September 2017 (EPA 2017).
- NSW EPA (2020) Consultants reporting on contaminated land; Contaminated land guidelines. New South Wales Environment Protection Authority (EPA 2020).
- Standards Australia (2005) Australian Standard AS 4482.1-2005 – Guide to the investigation and sampling of sites with potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds. Standards Australia, Homebush, NSW (AS 4482.1-2005).
- Standards Australia (1999) Australian Standard AS 4482.2-1999 - Guide to the sampling and investigation of potentially contaminated soil. Part 2: Volatile substances. Standards Australia, Homebush, NSW (AS4482.2-1999).

2 Site identification

2.1 Site details

Details related to the Site are included in **Table 2-1**, below whilst **Figure 1** and **2, Appendix A** shows the site context and features.

Table 2-1 Site Information

Details	Comments
Site address	445-459 Canterbury Road, Campsie NSW 2194
Lot and Deposited Plan	Lot 3 DP 337683 Lot 13 & 15 DP3995 Lot A & B DP 355656 Lot A & B DP 416123 Lot A & B DP 391661
Current Land use	Mixed commercial tenancies including car mechanic, furniture retail and mattress manufacture and food bank
Proposed Land use	Hospital
Local Government Authority (LGA)	Canterbury – Bankstown City Council
Current Zoning - Canterbury Local Environment Plan (2012)	B6 – Enterprise Corridor
Site Area	Approximately 4,400 m^2
Site Coordinates (GDA2020 MGA 56)	South-west site corner E: 324892 N: 6245371
Current Site Owner	HPG Australia Pty Ltd

2.2 Site information

Site information available from public datasets and extracted from the DSI (Cardno, 2017) is summarised in **Table 2-2**, information has been reviewed for accuracy as part of the preparation of this RAP.

Table 2-2 Site description

Item	Information
Site slope and drainage features (Nearmap, 2019)	The topography was observed to generally slope slightly away from the Site towards the north-east with an approximate elevation of ~26 mAHD at the north-eastern boundary and ~29 mAHD at the south-western. The southern carparking area was observed to be constructed so as to slope slightly towards Canterbury Road to the south. Surface water is collected on roof tops and impervious hardstand surfaces, then channeled via kerb and guttering. Surface water infrastructure was not observed within the north-western portion of the Site; however, a drainage system was observed within the north-eastern portion of the Site and within the mechanics workshop. Surface water infiltration is likely to occur through areas of exposed soil within the north-western portion of the Site, as well as cracks and fractures in the hardstand.
Nearby water bodies (NSW DFSI, Spatial Services)	Cup and Saucer Creek and the Cooks River are located approximately 640 metres (m) and 1 kilometre (km) to the south and north-east of the Site respectively. Previous reports identified groundwater beneath the site at between 1.39 and 2.08 m BGL.

Item	Information
Site soil landscapes (NSW OEH, 2013)	The site is shown as being underlain by the Blacktown soil landscape which is described as having gently undulating rises on Wianamatta Group shales and Hawkesbury shale. Local relief is up to 30 m with slope of usually <5% and broad rounded crests and ridges with gently inclined slopes. Vegetation is cleared eucalypt woodland and tall open-forest (wet sclerophyll forests). Soil are shallow to moderately deep (<100 cm) red and brown podzolic soils on crests, upper slopes and well-drained areas with deep (150-300 cm) yellow podzolic soils and soloths on lower slopes and in areas of poor drainage. Limitations for the landscape include moderately reactive, highly plastic subsoil, low soil fertility and poor soil drainage.
Site surface geology (GS NSW, 2018)	The site is shown as being underlain by the Triassic, Ashfield Shale of the Wianamatta Group which is described as black to light grey shale and laminate.
Acid sulfate soils	A review of the Canterbury Local Environment Plan (LEP) 2012 showed that the site is not in an area requiring development consent as a result of actual or potential acid sulfate soil risk.
Flooding potential	A review of the Canterbury Local Environment Plan (LEP) 2012 shows that the site is not in an area requiring development consent as a result of flooding risk.

2.3 Observations summary

Site observations in relation to specific site issues are summarised in **Table 2-3** and are based on the findings of the DSI (Cardno, 2017) and Cardno's site visits on 2 July, 30 September and 7 October 2020, .

Table 2-3 Observations summary table

Item	Observations
Site surface coverings	With the exception of the north-western portion of the Site adjacent to the mechanics workshop and mattress factory the Site is completely covered by hardstand in the form of the building slabs, parking areas and pavements. Hardstand areas were observed to be in moderate to good condition throughout the Site with no significant cracking or damage observed.
Site cut and fill	During the DSI, fill materials were encountered in the boreholes advanced across the Site and consisted of gravelly sands, sandy clays and clays. Building materials (bricks, ceramic etc.) were observed within fill materials. Observations within the DGI were consistent with these observations with the addition of MW6 identifying what is believed to be the backfill of a former underground storage tank (UST) pit. Subfloor areas within the site structure were accessed during the site visit on 2 July 2020 with some fill materials observed as containing brick and concrete fragments. From observations during this visit, fill materials were inferred to be primarily located beneath the southern and north-eastern carparking areas. The lower level of the existing site structure appears to have been cut into the slope to some degree but material volumes generated by this cut are estimated to be significantly less than anticipated fill volumes.
Buildings	The Site comprises light commercial facilities with frontage to Canterbury Road to the south, Stanley Street to the west and low density residential to the north and east. The Site is comprised of a concrete and brick warehouse style building divided into four portions with a separate business operating in each portion. Occupants of structures include: ▪ The Staples Bag – Grocery store ▪ Happy Furniture – Furniture store and manufacturer ▪ Sweeet Home – Homewares ▪ Arthur & Troy's Auto Repairs – Vehicle Mechanic
Potential hazardous building materials	The single structure onsite appeared to be of primarily brick and concrete construction with some metal cladding. Based on the style and inferred age of the structure it is considered likely that asbestos containing materials and lead based paints were used in its construction. Further to this, the proximity of the site to a major Sydney arterial road makes lead containing dust in ceiling cavities also likely.
Manufacturing, industrial or chemical processes and infrastructure	Manufacturing of mattresses was observed to be undertaken within the warehouse building, however is not expected to result in soil impacts as operations appeared to primarily consist of stuffing and sewing of mattresses. Operation of the automobile mechanics is expected to include the handling of petroleum and waste oils. Whilst the majority of work is expected to be undertaken within the workshop, which is underlain by a concrete slab, potential for soil impacts due to leakages is possible within the adjacent north-western parking area.

Item	Observations
Fuel storage tanks (USTs/ASTs)	Anecdotal evidence of two large (approximately 10,000L) USTs being removed from the north-western portion of the Site was obtained during the Site inspection. Evidence of hydrocarbon contamination (odours and light sheen) was also observed during the advancement of boreholes within the north-western portion of the Site. A small (approximately 1.5m by 1.5 m) structure, potentially a tank, was identified during service location adjacent to the mechanics workshop western roller door.
Dangerous goods	With the exception of the above noted USTs and oil and chemical use associated with the mechanic, no observations of dangerous goods use or storage were identified onsite.
Solid waste deposition	Site solid waste is managed through municipal and commercial waste streams with no waste materials appearing to be stored or buried onsite long term.
Liquid waste disposal features	With the exception of oil waste generated by the mechanic on site, liquid waste is currently disposed of through disposal to the Sydney Water operated sewer systems.
Evidence of previous site contamination investigations	Monitoring well gatic covers and reinstated bores were identified during the 2 July 2020 site visit and are consistent with locations identified in the DSI, no evidence of additional investigations was noted.
Evidence of land contamination (staining or odours)	Odours were not recorded during the DSI site walkover or the 2 July 2020 site visit. However, during the DSI intrusive investigation, hydrocarbon odours and staining were observed within boreholes BH2, BH3, BH4 and MW1 advanced within the north-western portion of the Site.
Evidence of groundwater contamination	No groundwater contamination sources were observed, though residual impact within the former tank pit appears to have affected groundwater quality at MW6 and the former presence of USTs at the site should be considered as possible sources.
Groundwater use	No evidence of groundwater use onsite was identified and the site is connected to the town water supply.
Vegetation	Minor amounts of landscaped vegetation consisting of native and introduced tree, shrub and grass species were observed adjacent to the Site. No evidence of impacts on vegetation due to contamination were identified during the DSI and site visit.
Site fencing	The northern, eastern and southern boundaries to the Site were bound by fencing, with the warehouse building directly abutting the western boundary (frontage to Stanley).

2.4 Inaccessible areas

Due to access limitations and site operations the following areas have not been visually assessed in detail during previous investigations:

Table 2-4 Inaccessible areas during site walkover.

Area	Justification
Operational internal areas of the current commercial tenancies	Request from HPG to avoid tenancy areas until structure is unoccupied and removed.
Areas covered by hardstand and / or structures	Partially assessed by DSI and to be assessed in detail once structure is removed.

2.5 Surrounding land uses

The area surrounding the Site generally consisted of low-density residential area. Land uses surrounding the site are detailed in **Table 2-5**.

Table 2-5 Surrounding Land Use

Direction	Land Use or Activity
North	Low density residential houses and an industrial building.
South	Generally low density residential houses with one large apartment block.
East	Low density residential housing, beyond which is a service station.
West	Stanley Street, beyond which is low density residential houses.

3 Previous reports

Cardno is aware of the following reports prepared with information relevant to the contamination status of the site:

- SMEC Testing Services (2014) – Preliminary Geotechnical Assessment
- TRACE Environmental (2014) – Preliminary Site Investigation
- Cardno (2017) – Detailed Site Investigation
- Cardno (2021) – Data Gap Investigation

These reports are summarised below in **Sections 3.1** to **3.3** with analysis results summarised in **Appendix C.**

3.1 SMEC (2014) Preliminary geotechnical assessment

SMEC Testing Services Pty Ltd (SMEC) were commissioned by Lone Star Construction Pty Ltd (SPBC) to undertake a preliminary geotechnical assessment of 445-459 Canterbury Road, Campsie NSW.

The purpose of the investigation was to assess potential subsurface conditions at the site, classify the site in accordance with AS2870; make comment on temporary and permanent support of the proposed excavation, recommend foundation design parameters and assess potential issues regarding rock excavation.

SMEC undertook a site walkover and desktop investigation of the site. Intrusive investigations were not undertaken as part of the assessment.

SMEC concluded that:

- Construction of the basement may require excavation near to the site boundaries, and therefore in close proximity to adjacent buildings.
- There is the potential for medium or high strength rock to be encountered which may necessitate the use of rock excavation equipment.
- Care should be taken so as to not damage buildings or other developments on adjacent properties when excavating rock. This may require the adoption of excavation methods which limit ground vibrations.
- Due to the proximity of the excavation to property boundaries, temporary support will be required for soils.
- The base of the proposed excavation is likely to be very stiff silty clays or weathered shale. In order to ensure compliance with bearing values, care should be taken to ensure the base of the excavations is free of loose material prior to concreting.

3.2 TRACE (2014) Preliminary site investigation

TRACE Environmental Pty Ltd (TRACE) were commissioned by Lone Star Construction Pty Ltd to prepare a Preliminary Site Investigation (PSI) for 445-459 Canterbury Road, Campsie NSW.

TRACE concluded that:

- The site has been used for commercial purposes since the 1960's which included automobile service and maintenance. Prior to this the site was used for low density residential purposes.
- At least two underground storage tanks were historically operating at the site, with both potentially still on site. The presence and historic use of USTs may be a source of subsurface impacts.
- Historic car maintenance and servicing activities, importation of uncontrolled fill and the presence of asbestos containing building materials may also be sources of potential soil impacts.
- The environmental site setting was considered to be moderately sensitive based on the preliminary CSM.
- The site is not located in an area of known acid sulfate soils.
- TRACE Recommended a Detailed Site Investigation (DSI) be undertaken.

3.3 Cardno (2017) Detailed site investigation

Cardno were commissioned by HPG to undertake a DSI for 445-459 Canterbury Road, Campsie NSW.

The purpose of this investigation was to provide the Client with advice on the contamination status of the Site and the consequent implications for its intended use.

Cardno undertook a scope of work that included:

- A review of previous reports and site information;
- An intrusive investigation by advancing 13 boreholes as follows:
  - Eight boreholes to a maximum depth of 3.1 m below ground level (m BGL) using a drill rig;
  - Two boreholes to a maximum depth of 0.5 m BGL using a hand auger; and
  - Three boreholes to a maximum depth of 6.3 m BGL and conversion to groundwater monitoring wells.
- Analysis of 20 primary soil samples by a NATA accredited laboratory for:
  - Total recoverable hydrocarbons (TRH) / benzene, toluene, ethylbenzene, xylenes, naphthalene (BTEXN)
  - Polycyclic aromatic hydrocarbons (PAHs)
  - Phenol
  - Metals (arsenic, cadmium, chromium, nickel, zinc, lead, mercury)
  - Organochlorine pesticides (OCP) / Polychlorinated biphenyls (PCBs)
  - Asbestos.
- Analysis of 3 primary groundwater samples by a NATA accredited laboratory for:
  - TRH / BTEXN
  - PAHs
  - Metals (arsenic, cadmium, chromium, nickel, copper, zinc, lead, mercury)
  - PCB / OCP.

  Results included in **Appendix C**.

Cardno (2017) concluded that:

- The site was covered by between 0.1 to 3.3 m of fill material. This fill material was described as dark brown sandy clay and gravelly sand overlying residual natural materials.
- Shallow perched groundwater was encountered between 1.39 and 2.08 m BGL.
- With the exception of the following, concentrations of COPC were below the adopted site assessment criteria:
  - TRH concentrations exceeded the adopted Ecological Screening Level ESL in boreholes BH3 and MW 1 at depths of 1.8 and 0.8 m BGL respectively. TRH in sample location BH4 exceeded management limits at depths of 1.5 m BGL and 2.5 m BGL.
  - Benzo(a)pyrene exceeded NEPM 2013 Ecological Screening Level for an Urban Residential / Public Open Space land use setting at BH6/1.2 (2.5 mg/kg), BH8/0.5 (4.3 mg/kg) and MW1/0.8 (0.7 mg/kg).
  - Elevated concentrations of arsenic, copper and zinc were reported in some samples, while all other metals remain below adopted assessment criteria. Exceedances of the adopted Ecological Investigation Levels for heavy metals were generally observed in fill materials to a depth of 1.5 m BGL.
  - Slight exceedances of the adopted ANZECC freshwater criteria for dissolved copper and zinc were observed within the three groundwater monitoring wells sampled, with an exceedance of the adopted drinking water guidelines criteria also reported for nickel in monitoring well MW1. Given the substantial distance of the site to sensitive groundwater receptors, the slightly elevated metal concentrations are unlikely to pose a risk to human health or the environment.

NOTE: The above identified exceedances are not considered significant and are primarily the result of a conservative application of the assessment criteria. A more thorough approach, including calculation of material specific added contaminant limits (ACL) for copper and zinc as well as adopting high-reliability criteria for benzo(a)pyrene (CRC CARE, 2017), is recommended for future assessments.

Recommendations included:

- Lateral and vertical delineation of the identified impacts with consideration of the need for waste classification due to the need to remove material from site as part of the proposed design.
- Preparation of a Remedial Action Plan (RAP) to include an Unexpected Finds Protocol (UFP)

Undertake a soil validation assessment at the completion of excavation and dewatering with recommendations of the validation approach to be detailed in the RAP.

3.4 Cardno (2021) Data Gap Investigation

Cardno (NSW / ACT) Pty Ltd (Cardno) was engaged by HPG Australia Pty Ltd (HPG) to resolve outstanding contamination data gaps with regards to their site located at 445-459 Canterbury Road, Campsie NSW. The purpose of this DGI was to provide HPG with updated information on the contamination status of soil and groundwater on-site to provide advice on risk to offsite receptors and planning of the proposed development.

Cardno carried out the following scope of work:

- Service location in the north-west corner of the site to identify underground utilities before commencing drilling and attempted to confirm the location or absence of a UST in the area;
  - Ground penetrating radar was used to identify UST location and extents near BH5 in the site workshop and their reported removal, adjacent north of the workshop.
- Gauging of existing wells MW1, MW2 and MW3 to determine serviceability. Gauging was undertaken using an interface probe and groundwater levels recorded.
- Installed three wells in the north-western corner of the site with a screen interval that captures the perched water at the soil-rock interface.
  - Well bores were initially advanced using push tube methodology to allow for collection of undisturbed soil samples. Solid flight augers were used once the push tube reached refusal to achieve the target depth.
  - Groundwater bores were constructed in general accordance with the NUDLC (2012) *Minimum Construction Requirements for Water Bores in Australia 3rd ed.* from 50 mm PVC-U screen and casing
- A soil bore was drilled in the vicinity of BH4 (drilled in the 2017 works) to prove the base of the TRH impact in this location.
- Groundwater samples were collected a week after well development from all six wells using a low-flow peristaltic pump. A water quality meter with flow cell was used to measure water parameters prior to samples.
- Laboratory analysis of collected samples at a NATA accredited laboratory for a suite of contaminants of concern. Results included in **Appendix C**.
- Prepared a conceptual site model to identify the potential risks to human health and the environment;
- Assessed the need for further investigations, remediation, management or risk assessment.

Cardno (2021) concluded that:

Based on the findings of this report, there are no human health risks to future and current site users however given the presence of metals, benzo(a)pyrene and total recoverable hydrocarbons (TRH) exceeding the adopted ecological criteria for groundwater, there is potential for a complete source pathway receptor (SPR) linkage. Due to the distance between the site and receiving surface water environments, the risk of a complete source pathway receptor link to these bodies is unlikely. The soil results were also used to provide an indicative waste classification and generally classed the materials investigated as General Solid Waste (non-putrescible) with leachability assessment required in some cases.

Cardno considers that at the time of undertaking the data gap investigation, the site is suitable for the proposed land use.

Recommendations included:

- Complete Stage 2 and Stage 3 as outlined and approved in the SAQP (Cardno, 2020).
  - Stage 2: Assessment of soils within the existing structure footprint and additional sample to clarify waste classification of previous locations.

        - Additional monitoring from wells installed on the northern boundary to confirm or identify change in TRH detections. Care should be taken during demolition to not disturb or damage these wells.
        - From the findings of this investigation a Remediation Action Plan (RAP) or other excavation guidance may also be prepared.
    - Stage 3: Consulting and environmental support during construction to ensure that materials are managed for offsite disposal as per excavation guidance and classifications. Further visual and sampling assessment of unexpected finds and final excavation surfaces may also be made to confirm site suitability.
- Preparation of a Construction Environmental Management Plan (CEMP) with an Unexpected Finds Protocol which considers risk to site workers during construction. With respect to site contamination, controls and management within the CEMP should include:
    - Use of contractors appropriately licenced in the removal of any hazardous materials identified including in residual structures and site soils; and
    - Demolition and / or removal of any hazardous materials prior to undertaking general demolition or bulk earthworks activities.

3.1 Site history suitability

The site history information summarised above is considered an accurate but preliminary characterisation of the site for the purposes of this report. A sizeable data gap exists beneath the structure on site which is proposed to be addressed by further testing following demolition. Upon completion of this testing the characterisation of the site should be reconsidered in light of the additional information. It should be noted however that given the proposed development includes excavation and removal of all material yet to be tested it is unlikely that further assessment will result in a finding that will significantly impact the following methodology or findings of site suitability.

4 Conceptual site model

A conceptual site model (CSM) provides an assessment of the fate and transport of contaminants of potential concern within the context of site-specific subsurface conditions with regard to their potential risk to human health and the environment. Risk to human health and the environment is identified through complete Source – Pathway – Receptor (SPR) linkages. In order to identify SPR linkages the CSM considers site specific factors, including:

- Source(s) of contamination
- Identification of COPC associated with past (and present) source(s)
  - It should be noted that the COPC listed in **Table 4-1** are a mixture of generic contaminants (i.e. typical contaminants for the identified source) and actual contaminants measured in the field
- Site specific information including soil type(s), depth to groundwater, inferred porosity, inferred groundwater flow direction and surface water bodies and interactions;
- Location of any identified sources relative to the proposed site development; and
- Actual or potential receptors considering both current and future land use both for the site, adjacent properties and any sensitive ecological receptors.

Based on the information collected as part of this PSI, including site history information, site observations, the following preliminary CSM has been developed showing potential SPR linkages considered to be potentially complete or incomplete under our understanding of the current and future land use.

Identified receptors for the potential site contamination include:

- Ecological receptors dependent on site soils in impacted areas;
- Current site users and workers; and
- Future site users and workers.

The two potentially completed SPR linkages identified at this time are not considered to present a risk in determining site suitability and can be easily managed as part of the proposed development as source materials and activities will be removed from site.

Table 4-1 Revised CSM

Source	Contaminants	Impacted media	Pathway	Receptor
TRH impacted soil and former USTs location	TRH, PAH, metals	Soils and groundwater in north west of the site. Groundwater onsite and north-east of site inferred, based on topography.	Dispersal via groundwater Direct contact with impacted media	Potential future ecological receptors if material remains onsite. Incidental contact with groundwater by offsite receptors.
Metals, PAH, TRH and impacted soils and fill	Metals, PAH, TRH	Soils and fill materials	Direct contact with impacted media	Future site workers during excavation and soil disturbance. Potential future ecological receptors if material remains onsite.

4.2 Data Gaps

Based on the results of this investigation, the following potential data gaps in site characterisation have been identified with relevant areas illustrated in **Figure 2** in **Appendix A**.

- Depth of the soil/rock interface was unable to be reached in the advancement of MW06 due to the wet sandy clay found in that location. During the installation of the 50mm PVC well screen and casing, the borehole collapsed, reducing its depth. Hydrocarbon odour was noted during borehole advancement and a light sheen was seen on water extracted during well development in this location.

Groundwater and soil results from this location indicate heavier semi and non-volatile hydrocarbon impact with no volatile fractions identified. Based on this, Cardno is satisfied that no vapour risk exists however further direct assessment of material in the vicinity of this location is warranted to inform waste and disposal options.

- Materials within the footprint of the site building are yet to be assessed. An appropriate sampling and analysis regime, such as that outlined in Cardno's SAQP will be necessary to inform appropriate waste and disposal options.
- Cardno was unable to locate the assumed UST presumed to still exist onsite below the mechanics workshop. However anecdotal evidence from the workshop owner revealed the former UST was located in the adjacent carpark below a concrete slab and had since been removed. Further investigation with a service locator did not reveal the presence of a UST under the slab. Due to the limited reliable history for the USTs onsite, potential exposure of tanks during demolition and excavation should be considered in the site Unexpected Finds Protocol.

5 Remediation objectives and criteria

The proposed concept designs (**Appendix B**) indicate that the site is to be excavated to a depth of between 6 and 9 metres to accommodate a basement car park before construction of a private hospital facility in above ground areas. Variation in excavation depth is a result of elevation difference between areas on the southern boundary and northern areas of the site.

As a result of the mixture of bulk excavation and areas of the site to remain at current grade, this RAP considers methodologies to appropriately manage bulk excavation (areas bound by the excavation footprint **Figure 2, Appendix A**) and remediate remaining areas such that identified SPR linkages in **Table 4-1** are removed or otherwise acceptable for the proposed use as a hospital with limited landscape areas. The remediation objectives therefore are as follows:

- Where possible, material to be removed from site is suitable to be classified for beneficial re-use, either as virgin excavated natural material (VENM) or under the NSW EPA Resource Recovery Order and Exemption such as excavated natural material (ENM);
- Any material that must be disposed of off-site as waste is done so in accordance with NSW EPA Waste Classification guidelines and regulations;
- To ensure that material remaining onsite is not impacted by contamination in a manner or to a level that would require ongoing management; and,
- Following completion of bulk excavations, the site is appropriately validated to demonstrate compliance with the remediation action plan for the site, compliance with contaminated land guidelines and all other applicable regulatory requirements, and to confirm that the site is suitable for the proposed use.

5.1 VENM and ENM classification criteria

Classification of material as ENM should be undertaken as per the NSW EPA *Excavated Natural Material Resource Recovery Order and Exemption* (NSW EPA, 2014) with sampling densities and analysis regimes to match the defined requirements.

The Protection of the Environment Operations Act (1997) provides the following definition for VENM:

'natural material (such as clay, gravel, sand, soil or rock fines):

a. *that has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial, mining or agricultural activities and*

b. *that does not contain any sulfidic ores or soils or any other waste*

and includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved for the time being pursuant to an EPA Gazettal notice.'

The NSW EPA provides the following four step process for assessing whether material is VENM which will be followed:

1. Are manufactured chemicals or process residues present?
2. Are sulfidic ores or soils present?
3. Are naturally occurring asbestos soils present?
4. Is there any other waste present?

For the purposes of assessing the presence of manufactured chemicals and process residues, Cardno outlined the threshold criteria in the Sampling and Analysis Quality Plan (Cardno, 2020) which has been approved by the Site Auditor, as follows:

- Organic contaminants (i.e. volatile and semi volatile organic compounds) – below the laboratory limit of reporting
- Inorganic contaminants (i.e. metals) – below ENM order absolute maximum criteria where comparable, otherwise below the laboratory limit of reporting.

5.2 Waste classification criteria

Any specific materials to be removed from site should be assessed in accordance with the NSW EPA *Waste Classification Guidelines* (2014) to determine the classification for off-site disposal. Given the nature of the identified soil impacts to date and the volume of material to be removed, to minimise the volume of material disposed as waste, waste classification will only be used for material not able to be classified as per the VENM or ENM criteria outlined above.

Liquid waste, such as contaminated groundwater, is pre-classified under the NSW EPA *Waste Classification Guidelines* (2014) with no chemical assessment required, as such assessment criteria will be directed by requirements of the licensed receiver of any liquid waste.

5.3 Validation targets

5.3.1 Soil

The soil validation targets for the proposed remediation are based on the *National Environment Protection (Assessment of Site Contamination) Measure* (NEPM) 1999*, as amended* 2013, in relation to investigation levels for soil in the assessment of site contamination (NEPC 1999).

As detailed in concept design provided in **Appendix B** any residual or exposed soils on the site are to be used primarily as landscaping or parks, soils in these areas will need to meet applicable human health and ecological screening criteria for recreational, urban residential and public open space land use. In order to assess vapour risk for basement and ground floor areas of the proposed hospital, Residential A & B health screening levels will be considered.

5.3.2 Groundwater

Groundwater monitoring undertaken prior to the preparation of this RAP has identified concentrations above LOR of semi- and non-volatile TRH compounds in wells MW05 and MW06. In addition to this, assuming upgradient wells MW02 and MW03 reflect background groundwater conditions, the metals arsenic and lead are also notably elevated in MW06.

The proposed design includes a concrete-lined basement which will be in contact with groundwater. The basement in contact with groundwater contaminated by volatile contaminants may result in a potential vapour intrusion risk, unless remediated or mitigated. It is anticipated that removal of the hydrocarbon impacted source materials (soils around the former UST pit and bowser) will in effect remove the potential groundwater volatile contamination and potential vapour intrusion risk.

To ensure complete protection of human health, validation criteria for TRH and other potentially volatile organic contaminants will thus be designated as below the laboratory limit of reporting.

Validation criteria for remaining groundwater analytes will be derived from historical monitoring of MW02 and MW03 to demonstrate that groundwater is consistent with historic concentrations. Groundwater results should be compared to the historic median, mean and maximum concentrations recorded across monitoring conducted in 2017 and 2020 as well as any further monitoring that may be undertaken.

Surface water protection criteria (ANZG, 2018) are considered to be an overly conservative validation criterion in the case of the site as the nearest surface water is Cup and Saucer Creek approximately 640 m to the south. The ability to measure risk to biota within Cup and Saucer Creek based on groundwater conditions on site is considered limited due to strong impacts from local geology, which will generally cause elevation of the results, as well as other impacts (including dilution) within the intervening land.

In order to protect future site users from direct contact risk non-volatile contaminants will also be validated based on methodology provided in Section 9.3.2 of the *Guidelines for Managing Risks in Recreational Water* (NHMRC, 2008) which allows the use of drinking water criteria multiplied by 10 for recreational waters and assumes 200 mL per day ingestion of impacted waters.

5.3.3 Aesthetics

Soils remaining onsite must comply with the aesthetic requirements provided in Section 3.6 of Schedule B1 of the NEPM (NEPC, 1999). The general assessment considerations include:

- The risk for a person to be injured by metal, glass or other sharp objects;
- That chemically discoloured soils or large quantities of various types of inert refuse, particularly if unsightly, may cause ongoing concerns to site users;

- The depth of the materials, including chemical residues, in relation to the final surface of the site; and
- The need for and practicality of any long-term management of foreign material.

Soils remaining within the site should be such that at surface there is no detectable odour, identifiable staining or large quantities of inert waste.

6 Remediation Options

6.1 Remediation Options Hierarchy

The potentially applicable soil remedial strategies were evaluated in accordance with the remediation hierarchy, which is based on Section 6(16) of the NEPM (NEPC, 1999) and endorsed by the NSW EPA.

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

If the above is not practicable then,

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

6.2 Remedial Options Evaluation

The remedial options listed above are evaluated below in **Table 6-1** which consider the available remedial options for impacted shallow fill material identified at the site.

Table 6-1 Remediation Option Evaluation

Remedial Option	Discussion	Acceptable yes / no
Option 1 On-site treatment of soil	This option includes on-site treatment of soil through disturbance (turning) to stimulate and encourage biological degradation and / or volatilisation of COPC through thermal treatment. The identified TRH impact may potentially be managed onsite by treatment of soils and groundwater however the planned development makes treatment impractical and unnecessary. Site area for treatment will be limited by the proposed excavation.	Not acceptable. Insufficient space onsite to allow for treatment Metals impact not suitable for treatment.
Option 2 Off-site treatment of excavated soil	This option includes off-site treatment of soil through disturbance (turning) to stimulate and encourage biological degradation and / or volatilisation of volatile COPC through thermal treatment. This option is considered when there is not sufficient space on-site to remediate site soils. The identified TRH impacted soils could be potentially be managed by offsite treatment however due to the volume of the proposed site excavation they will not be required onsite after treatment.	Not acceptable. Even if treated off-site, material will not be required onsite due to bulk excavation planned. Metals impact not suitable for treatment.
Option 3 Isolation of the soil on-site by containment	This option includes the encapsulation and/or capping of impacted soils with marker and capping layers designed to be appropriate to the contaminant, this may include soil or concrete. This remedial strategy relies on removing the completed receptor pathways to soil and groundwater with COPCs at concentrations above the targets presented in **Section 5.3**. If present, visible contaminant indicators would first be removed from surface soil under this remedial option. This strategy would necessitate leaving quantities of impacted soil at the site and will require a long-term environmental management plan (EMP). Further to this, under onsite containment groundwater impacts remain a potential issue.	Not Acceptable. This approach would require over excavation to create encapsulation cell and would not address groundwater impact without substantial engineering.

Remedial Option	Discussion	Acceptable yes / no
Option 4 Excavation and off-site disposal of impacted soil	This option includes the excavation and transportation of soil to an off-site facility licensed to accept the waste. The volume of material is tracked through waste dockets and weight tickets at the receiving facility. This approach will remove all impacted material from the site and strongly aligns with the proposed development that includes the excavation across the site to construct two basement car parks.	Acceptable. This approach will remove all impacted material. Waste classifications and volumes are not cost prohibitive at this time.
Option 5 Do-nothing with Environmental Management Plan	This option would involve leaving identified contamination in-situ and implementing an Environmental Management Plan (EMP). Under the current proposed development impacted material will need to be removed from the site, to undertake this material will need to be managed as waste for appropriate disposal. As a result do nothing is not possible	Not acceptable. Material must be managed to facilitate off-site disposal

Based on the evaluation above, implementation of a combination of Remedial Options 3 and 4 could mitigate the potential risks with the identified COPCs in a timely and cost-efficient manner. The advantages and disadvantages of these options are compared below.

6.3 Remedial Option Comparison

Options available for the remediation of impacted soils are assessed in **Table 6-2** below.

Table 6-2 Remediation Option Evaluation

Option	Description	Advantages	Disadvantages
4	Excavation and offsite disposal of impacted soils	Minimises potential risks to human health and environment Economically viable for smaller, localised areas of contamination with soils classified as General Solid Waste. Suitable long-term remediation option Removes liability for ongoing management	Costs of offsite disposal at a licensed facility. Potential for larger quantities of material than expected to require disposal. Prohibitive waste classifications (RSW or hazardous waste) limiting options and increasing costs for disposal facilities. Costs to import soil for construction purposes (if required) Not a sustainable approach to the management of the contamination on the site.

Based on the analysis included in the previous sections, our understanding of the proposed site works and final land-use, Cardno recommends off-site disposal as the most appropriate remedial option for the site.

7 Remediation strategy

Based on the process followed in **Section 6** the preferred remedial option for the site is excavation and offsite disposal of unsuitable materials. This proposed strategy considers the proposed site layout and ability to manage impacted material onsite with the management methodology outlined in **Sections 7.1 to 7.4** below.

A Construction Environmental and Waste Management Plan is included in **Section 9**. Potential risks to site workers during construction can be managed through standard OHS practices which are detailed in **Section 10**. The soil validation plan is detailed in **Section 8**. A contingency plan is included in **Table 7-1**.

7.1 Remedial Strategy

7.1.1 Additional waste classification and delineation sampling

As per the Stage 2 investigations in the auditor approved SAQP (Cardno, 2020), following structure demolition, the following scope of work will be undertaken to close out data gaps in soils underlying site structures and delineate material classifications for off-site disposal.

- With the aid of an excavator Cardno will undertake a test pitting program across the site, this will include:
  - Seven test pits within the footprint of the site structure to improve site coverage and remove uncertainty around the potential for gross or widespread contamination.
  - Re-sampling at the seven locations identified as containing results in exceedance of general solid waste (CT1) criteria to allow for measurement of contaminant TCLP leachability.
  - Any additional test pitting and sampling required to delineate contamination extent or target contamination identified following structure removal, such as TRH impact around BH4.
  - Works undertaken at this stage will consider guidance from the Victorian EPA (2009) *IWRG702: Soil sampling* or equivalent updated guidance to ensure that sampling rates are sufficient to allow for necessary statistical analysis of results.
- Samples will be collected from near surface, 0.5 mbgl and every meter thereafter with additional samples collected at change in strata or contamination indicators. At least one sample at each location will also be collected from material identified as natural soils.
  - Based upon a site area of 4,400 m2 and assuming a fill profile of 2 m thickness across the site there is approximately 8,800 m3 of fill on the site, this is likely an overestimation but used as a guide for sampling selection. The IRWG702 (Vic EPA, 2009) would require 35 samples for characterisation of 8,800 m3, as a result 28 primary samples will be targeted at fill in addition to the 8 samples previously collected from fill.
- Approximately 35 primary samples, including at least one sample of natural material from sample location, will be dispatched to a NATA accredited laboratory and analysed for the following analytes:
  - Asbestos (presence / absence);
  - TRH;
  - BTEX;
  - PAH;
  - Metals;
  - TCLP metals; and
  - TCLP PAH.

  Further analytes may be added if they are identified as being of potential concern based on observations. If an excavated natural material (ENM) classification is to be sought for certain materials onsite then further analysis will be undertaken for relevant samples for:
  - pH;
  - Electrical conductivity; and
  - Foreign materials content.

- Once results have been received this RAP will be updated to provide guidance on how to make the site suitable for the proposed land use including methodologies and procedures for the removal of material from site as proposed.
- A waste classification documentation or equivalent will also be provided based on the classification of site materials in-situ.

7.1.2 Excavation and removal of materials

Once the updated version of this RAP has been approved site excavation works are to proceed under the following general process:

1. Removal of unsuitable soils and fill, classified as waste;
    a. Unsuitable soils will be those that do not meet the chemical or aesthetic criteria for soil outlined in **Section 5.3**, are negatively impacting groundwater quality and / or do not meet other project requirements, including geotechnical suitability.
    b. Where soils and fill are removed as waste validation sampling is to be undertaken for residual surfaces, as outlined in **Section 8**. Validation will be required to demonstrate that residual surfaces either meet the ENM / VENM criteria outlined in **Section 5.1. If** no further excavation is to take place the validation criteria nominated in **Section 5.3** will be used to demonstrate that unsuitable material has been wholly removed.
    c. Where possible unsuitable soils may be replaced with suitable material fill from other areas of the site, material used as replacement should be demonstrated to meet the validation criteria nominated in **Section 5.3.**
2. Following removal of waste and validation of the residual surfaces remaining excavation works can proceed with removal of underlying material as VENM or ENM.
    a. ENM classification will need to be verified with pH, electrical conductivity and foreign materials content analysis, in conjunction with any additional chemical analysis required to meet the requirements within the ENM Order (NSW EPA, 2014).

During and following excavation of the site a validation assessment will be undertaken to provide a final statement of suitability for the site.

- Attendance at site of an experienced Environmental Scientist at hold points during the excavation process. These hold points will be identified will include, when permanent groundwater is encountered, potential contamination is identified or removed and when the excavation to final levels is complete.
- Site attendance will include a visual assessment for contaminant indicators and to ensure that ground conditions are consistent with mapped geology and previous investigations.
    - Samples may be collected if potential indicators of contamination such as odour, staining or sheening are identified.
- Upon completion of the final site visit a Validation Report will be prepared summarising the findings of the inspections and any sampling under taken. The Validation Report will also include a final statement of site suitability for the proposed development and the effectiveness of the implementation of the RAP.

7.2 Imported material acceptance

Material imported to the site to be used as fill must be sampled and analysed in accordance with the relevant NSW EPA resource recovery orders and exemptions (e.g. excavated natural material [ENM]) or meet the definition of virgin excavated natural material (VENM) and be accompanied by a classification certificate. Classification documentation must include material source, volume and descriptions, sampling methodology and laboratory analysis results and certificates.

Each load of imported material must be inspected by an appropriately experienced and qualified individual to confirm the material is consistent with the description of the accompanying certificate and meet the definitions of the relevant classification. Imported material must also be sampled and analysed at a minimum rate of one sample per 1,000 m^3 with at least three samples per source. Material must also be considered geotechnically and aesthetically suitable by the validation consultant.

All results should be below the guidelines provided within the relevant RRO or for VENM compared to the ENM RRO for metals with non-detect adopted for organic compounds. A register of imported material will be

maintained which will include the origin of the material, classification type, volumes, date of importation, haulage contractor name, photographs and a description of imported material

7.3 Reporting

7.3.1 Visual inspection report

Visual inspection reports should be prepared for any site inspection. These should be brief reports that capture the inspection timing and conditions as well as the condition and suitability of the cap.

7.3.2 Imported and site won material testing

Where capping material is to be imported or re-used from site, the material must be subject to visual and analytical screening to ensure suitability. This assessment should be documented as noted in **Section 7.2.**

Prior to importation or re-use of any material on site as fill, the relevant documentation, including classification certificates and reports, will be provided to the appointed environmental consultant for review. Material will not be imported to site until the environmental consultant has approved the materials in consideration of the current resource recovery exemptions / orders and remediation objectives for the Site.

7.3.3 Waste classification and waste tracking

All waste classification and waste tracking documentation compiled during the site remediation works will be prepared in accordance with relevant NSW EPA regulatory guidelines. All waste classification certificates, waste tracking and disposal records will be included within the relevant validation report for each remediation zone.

7.3.4 Other documentation

In addition to any documentation identified in **Sections 7.3.1 to 7.3.3**, any information relating to site preparation and development, unexpected finds, and remediation validation should be collated for summary and inclusion with in the final Validation report. Such information may include photographs, survey records, designs and as-builts.

7.3.5 Validation report

A final validation report will be prepared following emplacement of the final cap. The report will document works, as completed, including compliance with, and if necessary approved variations from, this RAP. The report must make a final statement on the suitability of the site for the proposed land use and well as any conditions upon that suitability, such as an LEMP.

Validation reporting is to be prepared in accordance with the NSW EPA (2020) *Consultants reporting on contaminated land* and *National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended 2013*.

7.4 Remediation Contingency Plan

As with any remedial scope of work, unanticipated events or outcomes may be encountered during the remedial program. Cardno has developed contingencies throughout the RAP to mitigate risks associated with potential issues that may arise during the remedial works. Contingency items considered for the current remediation are summarised in **Table 7-1** noting that there may be other unforeseen circumstances that may arise during the course of the works.

Any variation from the remedial methodology noted above is to be approved by the Site Auditor prior to implementation.

Table 7-1 Remedial Works Contingency Plan

Potential Issue	Contingency Measures
Additional potential sources of impact are discovered during establishment of site levels or validation	Additional sampling locations will target the location of the potential sources (if identified) The COPC analytical suite may be adjusted based on the nature of the potential source The Unexpected Finds Protocol summarized in **Section 9.6** will be communicated to the remedial / construction contractor and followed during the construction phase of the project. Document is to include the potential for USTs and associated impacts.
Unintentional release of stockpiled soil or water drained from stockpile	Construction of appropriate erosion and sedimentation controls around the stockpiles Spill equipment will be staged on-site during the remedial works. Weather forecasts will be monitored throughout the course of the remedial works to anticipate any significant storm events. Works may be suspended if large volumes of rain are anticipated. Soil stockpiles would be sufficiently covered prior to any storm event.
Identification of undocumented asbestos cement sheeting fragments identified	Implementation of a UFP that considers asbestos contamination with documentation to be prepared for incorporation within the Validation Report, as noted above.
Imported material is determined unsuitable	If identified prior to entry onto site material is to be stopped at the site gate and returned to the point of origin. If emplaced prior to unsuitability is identified, material is to be isolated and demarcated. If stockpiled prior to removal offsite the stockpile should be lined to avoid contact with unimpacted ground surfaces. Any material leaving site must undergo waste classification to allow for appropriate disposal offsite.

8 Validation and verification sampling

Where sampling is required as part of the site validation and verification process the following outlines the general limits of the approach to be undertaken. Where sampling is deemed to require an alternative approach to that described below that is to be justified and documented in a separate sampling plan to be approved and included in the Validation Report.

8.1 Data quality objectives

The NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd Edition)*, which is endorsed by the NSW EPA under s105 of the *Contaminated Land Management Act 1997*, and the NSW EPA (2020) *Consultants reporting on contaminated land: Contaminated land guidelines*, requires that Data Quality Objectives (DQOs) be identified for all assessment and remediation programs. The DQO process as adopted by the NSW EPA is described within US EPA (2000) *Guidance for the Data Quality Objectives Process and Data Quality Objectives Process for Hazardous Waste Site Investigations*.

The DQOs for the SAQP are summarised in **Table 8-1**, below.

Table 8-1 Data Quality Objectives

DQO Step	Discussion
Step 1: State the Problem	The Site has historically been used for residential and commercial / industrial land uses which have included activities such as retail stores and vehicle mechanics. Soil sampling may need to be undertaken as part of this RAP process to: ▪ Validate soils to remain onsite above the marker layer; ▪ Verify soils imported onsite are suitable for the proposed land use and are consistent with the accompanying classification documents; and ▪ Determine the waste or beneficial re-use classification of site soils to allow for appropriate removal from site.
Step 2: Identify the decision / goal of the study	The decisions that must be made are: ▪ Are soils suitable to remain onsite under the proposed land use? ▪ Can material be classified for offsite disposal as waste or for beneficial re-use?
Step 3: Identify the information inputs	The primary inputs to the decisions described above are: ▪ Guidelines made or approved by the NSW EPA. ▪ Results of previous assessments conducted on the site. ▪ Information gathered during the assessment of fill and natural soils. ▪ Laboratory analysis of soil for relevant COPCs, based on previous assessments and / or intended use; ▪ Assessment of the suitability of the analytical data obtained, against the Data Quality Indicators (DQIs) outlined below; and ▪ Aesthetic observations of soils, including odours, staining and waste inclusions.
Step 4: Define the boundaries of the study	The boundaries of the study are: ▪ Lateral - the intrusive investigations will be limited to the boundaries of the property identified in **Table 2-1 and Appendix A**. ▪ Vertical – the maximum vertical extent of any assessment will be to the base of excavation required for construction. ▪ Temporal – Utilising the full dataset available the temporal boundaries of the assessment are 2017 until the completion of construction works. The results will remain valid as long as the land use remains passive and no new sources of contamination are introduced to the Site.
Step 5: Develop the analytical approach	The intrusive investigation analytical approach to be adopted is outlined in **Section 8.4**

DQO Step	Discussion
Step 6: Specify performance or acceptance criteria	Two primary decision error-types may occur due to uncertainties or limitations in the project dataset: ▪ A sample / area may be deemed to pass the nominated criteria, when in fact it does not. This may occur if contamination is 'missed' due to limitations in the sampling plan, or if the project analytical data set is unreliable. ▪ A sample / area may be deemed to fail the nominated criteria, when in fact it does not. This may occur if the project analytical dataset is unreliable due to inappropriate sampling, sample handling or analytical procedures. The following aspects were considered when establishing the acceptable limits on decision errors: ▪ The null hypothesis for the project is: the sample / investigation area is deemed to be contaminated. Sufficient weight of evidence, via the uses of statistical analysis (e.g. 95% upper confidence limit of the mean (UCL)) and / or gathering multiple lines of evidence (e.g. desktop review and laboratory analytical data), would be required to reject / disapprove the null hypothesis. ▪ A quality assurance / quality control (QA/QC) assessment evaluating the reliability and useability of data, which are expressed as five data quality indicators (DQI) summarised in **Section 8.2**.
Step 7: Develop the plan for obtaining data.	The recommended assessment strategy is designed to meet the project objectives in **Section 1.1** and the DQOs outlined above. The assessment scope will be optimised based on the ground conditions encountered during the field sampling program. To achieve the DQOs and DQIs, an assessment approach is detailed in **Section 8.4**.

8.2 Data quality indicators

The following Data Quality Indicators (DQIs), referenced in Step 6 in **Table 8-1**, have been adopted in accordance with the NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd Edition)*. The DQIs outlined in **Table 8-2** assist with decisions regarding the contamination status of the Site, including the quality of the laboratory data obtained.

Table 8-2 Data Quality Indicators

Data Quality Indicator	Frequency	Data Acceptance Criteria
Completeness		
Field documentation correct	All samples	The work will be documented in accordance with Cardno SOPs
Soil bore and test pit logs complete and correct	All samples	The work will be documented in accordance with Cardno SOPs including review by senior staff prior to issue
Suitably qualified and experience sampler	All samples	Person deemed competent by Cardno collecting and logging samples
Appropriate lab methods and limits of reporting (LORs)	All samples	Samples will be analysed using NATA approved methods
Chain of custodies (COCs) completed appropriately	All samples	Transfer of all samples will be in accordance with Cardno SOPs
Sample holding times complied with	All samples	The samples are required to submitted for extraction within holding times specified by the NATA laboratory
Proposed/critical locations sampled	-	Proposed/critical locations have been identified in **Section 6**
Comparability		
Consistent standard operating procedures for collection of each sample. Samples should be collected, preserved and handled in a consistent manner	All samples	All works will be undertaken in accordance with Cardno SOP's

Data Quality Indicator	Frequency	Data Acceptance Criteria
Experienced sampler	All samples	Person deemed competent by Cardno collecting and logging samples
Climatic conditions (temp, rain etc) recorded and influence on samples quantified (if required)	All samples	Climatic conditions documented in field sheets
Consistent analytical methods, laboratories and units	All samples	Sample analysis is to be in accordance with NATA approved methods
Representativeness		
Sampling appropriate for media and analytes (appropriate collection, handling and storage)	All samples	Sample analysis is to be in accordance with NATA approved methods
Samples homogenous	All samples	All works undertaken in accordance with Cardno SOP's. Samples are not to be collected across strata
Detection of laboratory artefacts, e.g. contamination blanks	-	Laboratory artefacts assessed and impact on results determined
Precision		
Blind duplicates (intra-laboratory duplicates)	1 per 20 samples	<30% RPD (Inorganics) <50% RPD (Organics) No Limit RPD Result <10 × LOR
Laboratory duplicates	1 per 20 samples	<20% RPD Result > 20 × LOR <50% RPD Result 10-20 × LOR No Limit RPD Result <10 × LOR
Accuracy (Bias)		
Split duplicates (inter-laboratory duplicates)	1 per 20 samples	<30% RPD (Inorganics) <50% RPD (Organics) No Limit RPD Result <10 × LOR
Surrogate spikes	All organic samples	50-150%
Matrix spikes	1 per 20 samples	70-130%
Laboratory control samples	1 per 20 samples	70-130%
Method blanks	1 per 20 samples	<LOR

8.3 Quality assurance / quality control

To meet the DQOs and DQIs outlined above, the following additional Quality Assurance / Quality Control (QA/QC) procedures will be undertaken**.**

Table 8-3 Summary of Data Quality Indicators

Requirement	Comments
Equipment calibration	Provision of calibration certificates. The scientific instruments such as a PID and water quality meter, will be calibrated by the manufacturer and zeroed / calibrated on the day in the form of a 'bump test' or equivalent. The records of the calibration(s) will be presented in the report.
Equipment decontamination	Decontamination of sampling equipment where needed. Sampling equipment that is not disposable, such as hand tools, will undergo the following decontamination process: ▪ Wash equipment in water that contains a mixture of water and Decon 90, with the objective to remove sediments and particulate from the equipment. A brush should be utilised where necessary. ▪ Rinse decontaminated equipment with potable or deionised water.

Requirement	Comments
Soil logging	Logging soils in general accordance with the Unified Soil Classification System including sample information recording on the geological log sheets.
Sample media identification	Samples to be marked with a unique identifier including project number, sample location, depth and date.
QA/QC Field duplicates / triplicates / field blanks and trip spikes	Duplicate samples will be collected at a rate of 1 every 20 primary samples completed at the primary intra-laboratory; and triplicate samples at a rate of 1 every 20 samples to be analysed at the secondary inter-laboratory. One laboratory provided trip blank and trip spike will be submitted at a rate of 1 per sample dispatch.
Sample preservation	Collected soil and water samples placed in a chilled icebox with ice for storage and transport to the laboratory.
Chain of Custody (COC) documentation	COC forms detailing sample identification, collection date, sampler and laboratory analysis required. The COC form to be signed off and returned to Cardno by the laboratory staff upon receipt of all the samples.
NATA accredited methods	NATA accredited laboratories will analyse the samples in accordance with NATA accredited methods.
Rinsates (where sampling equipment is reused)	Rinsate samples to be collected at least once a day per one device used for sampling (e.g. hand tools). Rinsate sampling containers and rinsate water will be supplied by the primary analytical laboratory.

8.4 Sampling procedures

The intrusive sampling procedures that will be implemented during the investigation are summarised below in **Table 8-4**. Sampling procedures were developed in consideration of the guidance provided *in Schedule B2 Guideline on Site Characterisation* of the National Environmental Protection Measure (NEPC 1999).

Table 8-4 Intrusive Sampling Procedures

Activity	Details
Service location and excavation permits	In consultation with the Principal Contractor the requirement for service location will be determined. A review of site services will be undertaken and an excavation permit prepared as per Principal Contractor policy.
Sampling rates and densities	Verification sampling of imported materials is to be undertaken at a rate of 1 per 1,000 m^3 of imported soil with a minimum of 3 samples per source site irrespective of volume. The total volume to be visually assessed to ensure consistency with classification documentation provided by the supplier. For material re-use and waste classification it is anticipated that most sampling will be undertaken from stockpiles and ex-situ volumes of material. Sampling densities are generally proscribed as 1 per 25 m^3 for up to 200 m^3 of material with greater volumes allowed lower sampling densities with appropriate statistical justification. In this case the sampling rates should be derived from Section 7.5, Schedule B2, of the NEPM (NEPC, 1999). In-situ sampling where necessary should consider the guidance from Section 6, Schedule B2, of the NEPM (NEPC, 1999), alternatively if this sampling will be attempting ENM classification then the NSW EPA (2014) *Excavated Natural Material Order* should be considered.
Soil sampling	▪ Each soil sample (including duplicates) will be screened for volatile organic compound (VOC) content with a calibrated photo-ionisation detector (PID) as per Section 7.7.3, Schedule B2 of the NEPM (NEPC, 1999). The methodology for PID headspace testing will include partially filling an airtight container with a fresh soil sample and then analysing the headspace vapour using an appropriately calibrated portable PID. ▪ The geological profile and observations of each test pit or sampled material will be logged on Site. All material will be assessed for potential indicators of contamination including odour, sheen, staining and the presence of asbestos containing materials. ▪ Samples will be collected excavator bucket or ground surface by hand using disposable nitrile gloves and transferred to laboratory provided glass jars and sampling bags appropriate for the analysis type. All soils will be collected on the same day as excavation to ensure that contaminants prone to degradation / weathering (such as volatile compounds) are representative.

Activity	Details
	▪ Samples will be stored on ice in an ice box after collection and during transport to the analytical laboratory under standard chain of custody procedure. ▪ Primary and replicate soil samples will be submitted to NATA Accredited laboratories for analysis.
Decontamination Procedure	Reusable sampling equipment such as hand tools (shovel, trowel, mattock), if required, will be decontaminated by washing with phosphate free detergent (Decon 90) followed by a rinse with potable water
Sample Preservation and Transport	Samples will be placed in laboratory supplied containers and stored on ice in an ice box while on Site and in transit to the laboratory under Chain of Custody documentation.

8.5 Minimum analysis suites

Table 8-5 provides a matrix for the minimum analysis required under each sampling and analysis scenario.

Table 8-5 Analysis suite matrix

Analyte	Imported material verification only	ENM – Export only	Waste Classification
TRH	X	X	X
BTEX	X	X	X
Metals	X	X	X
OCP	X	-	X
OPP	X	-	X
Phenol	X		
PAH	X	X	X
Asbestos – Presence Absence	X	X	X
Asbestos – NEPM / WA DoH	-	-	-
pH	-	X	-
Electrical Conductivity	-	X	-
Foreign Materials	-	X	-
TCLP	-	-	X

Waste classification activities are also to follow the steps of the waste classification process, as outlined below and detailed in the NSW EPA (2014) *Waste Classification Guidelines, Part 1: Classifying Waste*:

Step 1: Is the waste special waste?

Step 2: Is the waste liquid waste?

Step 3: Is the waste pre-classified?

Step 4: Does the waste possess hazardous characteristics?

Step 5: Determining a waste's classification using chemical assessment

Step 6: Is the waste putrescible or non-putrescible?

9 Construction Environmental and Waste Management Plan

The following sections include a Construction Environmental and Waste Management Plan which provides measures required to minimise the potential impact of works on the local environment, site workers and third parties. In all cases, environmental issues must be managed by the Principal Contractor in accordance with good environmental management practices with periodic supervision and documentation by the appointed environmental consultant. The purpose of these measures is to prevent site workers, the public and environmental exposure to potential health risks associated with these works.

9.1 Heritage Constraints

Areas and objects of heritage significance are not known to exist at the Site. Despite the absence of known areas and objects, the remedial and validation works will need to be considerate of unexpected finds.

9.2 Stockpile Management

Soil may require stockpiling during the Site remediation including resultant soil material from remediation excavations. Soil stockpiles will be tracked according to the origin and storage of the stockpile. Stockpiles in place longer than 24 hours will be compacted and covered and placed on an impervious base.

The stockpile(s) should be clearly labelled, with stockpiles known or suspected of containing contaminated material, appropriately identified with warning signage. Stockpiles of contaminated material should be placed on an impervious membrane and covered to prevent mobility of airborne dust and particulate. Any stockpiled asbestos contaminated material should be dampened and covered with either geofabric layer or equivalent, which is to be disposed of as asbestos waste after completion of asbestos works.

Stockpiles are to be contoured to minimise the loss of material during rainfall, with upgradient drainage and levee banks installed to divert water flows around the stockpile. Silt fencing is to be appropriately placed and installed to avoid sediment loading of stormwater drains and pipes. The installation of these controls is to be undertaken in accordance with the Landcom (2004) “Blue Book” and the site stockpile, erosion and sediment management plans.

9.2.1 Waste Disposal Tracking

Tracking of waste movements around the site and material transported off-site for disposal is a critical component to demonstrate the remedial strategy is being implemented appropriately. Waste tracking will be achieved through use of waste disposal dockets, survey of stockpiled materials or excavations and photographic documentation of movements of soil around and off-site. An environmental scientist should be on-site to oversee the remedial works to ensure that appropriate waste tracking procedures are employed.

9.3 Excavation Water Management

Based on the recorded groundwater depths during investigation it is not expected that groundwater will be encountered during the construction of the encapsulation. Potential exists for groundwater to be encountered during the emplacement of services or rain to accumulate in excavations. Excavations should be designed to minimise the inflow of water as much as is practicable to minimise volumes requiring management.

If accumulated water (either groundwater or rainfall) is to be extracted from excavations then it is to be managed in accordance with applicable guidelines and criteria. This may include assessment by a suitably qualified environmental consultant to determine suitability for discharge and re-use onsite or extraction and disposal offsite at an appropriately licensed liquid waste facility as per the NSW EPA (2014) *Waste Classification Guidelines*.

9.4 Air and Dust

9.4.1 Odours

Due to the nature of contamination identified on site, it is not anticipated that nuisance odours will be generated. Should odour be generated that is likely to impact sensitive receptors, such as neighbouring residents, on-site spraying of the excavated material with a suitable odour suppressant (ie. Anotec) will be undertaken to minimise any odour. Other options that may also be employed are:

- A reduction in the size of the excavation face that is open at any one time to reduce the surface area generating the odour;
- Location of any temporary stockpiles of impacted soil as far as possible (and in the predominant down wind direction) from sensitive receptors;
- Smothering of the odours by covering the portion of the site that is generating the odour; and
- Watering the stockpiles and excavations to minimise volatile emissions.

9.4.2 Dust Control

The Principal contractor will be responsible for ensuring that excavation, loading, carting, and stockpiling operations are dust free. This may include (but is not limited to):

- Stockpile protection;
- Water application on stockpiles and access roads;
- Limiting the area of exposed excavations and surfaces; and
- Wind fences around earthworks areas.

In the event that excessive dust is generated during any operations on-site, the works will cease and modifications to the process will be made before the operation is resumed. There must be no observable dust transported off-site.

9.5 Removal of Asbestos Waste

Based on results of previous investigations asbestos impacted soils or fill materials have not been identified on the site however given the typically heterogeneous nature of asbestos in soil contamination, potential for asbestos impacts remain. If asbestos impacted soils are identified, works in the area must stop to allow for appropriate management including remediation of the identified asbestos contamination.

Any asbestos removal activities are to be conducted in accordance with the SafeWork NSW (2019) *Code of Practice: How to safely remove asbestos* and SafeWork NSW (2014) *Managing asbestos in or on soil*. This includes:

- Notification and seeking of approvals from SafeWork NSW;
- Removal conducted by an appropriately licenced removalist, Class A for friable, Class B for bonded; and
- Independent competent person (bonded) or Licensed Asbestos Assessor (friable) providing clearance and validation sampling at the end of the removal works.

No asbestos impacted material is to be used or remain onsite under the current remedial strategy.

9.6 Unexpected Finds

The remedial works are to occur concurrent with the site redevelopment activities with some oversight by an environmental consultant. A detailed Contingency is included in **Section 7.4** and an Unexpected Finds Protocol (UFP) is detailed below.

In the case that an environmental consultant is not available for oversight, workers will be vigilant for materials that may impact the soil suitability for the proposed land use, particularly for soils to be emplaced over the marker layer. Unexpected finds include, but are not limited to, odour, visual contamination, anthropogenic materials (i.e. large quantities of building materials), asbestos containing material, Underground Storage Tanks (USTs), or any other suspect materials. Any unexpected finds will be reported to the Contractor's on-site manager immediately. Additionally, the site owner/occupier should be informed as soon as practical following an unexpected find.

If an unexpected find is discovered during excavations the Contractor shall:

- Cease all work in that vicinity
- Remove workers from the vicinity and limit access to the area (i.e. fencing, bunting or signage)
- An experienced environmental consultant should be contacted to assess the potential risks associated with the Unexpected Finds and provide appropriate management options
- Investigate the nature of the risk of the materials, determine the appropriate response and document the actions in accordance with contractual obligations.

In the event of a serious unexpected find, which could cause immediate harm to human health and/or the environment, Canterbury Bankstown Council, and the NSW EPA may need to be informed.

The risks posed by the removal works to Aboriginal or European heritage are expected to be minimal. However, in the event potential heritage items are encountered during excavations, works will cease and the Site Supervisor notified.

9.7 Stormwater

9.7.1 Erosion and Sedimentation Control

Cleared areas and exposed excavations may promote erosion. The following erosion and sediment controls will be implemented:

- Limiting the extent of cleared areas and exposed excavations
- Backfilling of excavated areas as soon as practicable
- Diversion of stormwater from active areas using hay bales or sediment fences
- Covering of temporary stockpiles with plastic (HDPE) and placement of silt socks around excavations when necessary
- Covering open stormwater grates in the vicinity of stormwater pits and excavations with silt fences or other appropriate materials
- Placement of stockpiles away from footpaths, roadways, kerbs, access ways or drainage lines
- Minimising translocation of contaminated soils throughout the site by ensuring excavator operators do not track over contaminated areas
- If possible, a single vehicle entry and exit to minimise translocating soil
- Depending on the volume of soil to be excavated, rumble strips may be required at the site access in order to prevent contaminated soil being transported off-site.

The installation of these controls is to be undertaken in accordance with the Landcom (2004) “Blue Book”.

9.8 Noise

The hours of operation will comply with Council requirements to control noise from site works

- 7am and 5pm Monday through Friday
- 8am to 1pm Saturdays.
- No work is permitted on Sundays or public holidays.

No demolition or excavation works will occur on Saturday & Sundays. Excavation work includes the use of any excavation machinery and the use of jackhammers, rock breakers, excavation loaders and the like, regardless of whether the activities disturb or alter the natural state of the existing ground structure or are breaking up/removing materials from the site.

9.9 Land Disturbance

Works include excavation, loading, carting and stockpiling operations of associated soils. These works shall be carried out in an orderly manner to minimise impact to the surrounding residences.

- Excavation - the removal of soil shall be performed by the appointed excavation contractor using an excavator. If a transport truck is not on-site during excavation and soil will need to be temporarily stockpiled, no contaminated soils should be placed on areas validated as suitable for the proposed mixed land use. In these locations, soil shall be excavated and placed on a suitable plastic liner or on concrete surfaces in discrete stockpiles prior to off-site disposal. Stockpiles should be segregated for each potential contamination source.
- Loading and Carting – the loading of the stockpile material shall occur with an appropriately sized loader. The trucks and trailers shall be covered for transport as deemed necessary, and shall meet any other statutory requirements.

9.10 General

The appointed Principal Contractor shall ensure compliance with relevant WorkSafe NSW guidelines and Occupational Health and Safety Regulations. The Principal Contractor shall also ensure compliance with any amendments to the Act or Regulations during the project duration.

The Principal Contractor shall monitor and control the access of all persons to the site and ensure that no unauthorised persons enter the site during remedial works (wherever practicable). All site personnel and visitors will be inducted and shall wear appropriate personal protective equipment (PPE).

The appointed Principal Contractor shall undertake additional underground and overhead service location specifically in areas surrounding the remediation location.

Any open excavation(s) are to be barricaded in accordance with the NSW Occupational Health and Safety Act; Clause 16 (1) and the Construction Safety Regulation Section 73, as administered by WorkCover NSW.

The appointed Principal Contractor shall install warning signs on the barricades surrounding the excavations, including but not limited to: DANGER: OPEN EXCAVATIONS; DANGER: NO SMOKING.

9.10.1 Vehicles

The appointed Principal Contractor shall ensure all vehicles are suitably contained and covered in the transport of all debris, spoil, rubbish and materials to or from the site, such that spillage or contamination of adjoining and other areas or property shall be prevented.

Vehicles shall also be maintained to prevent the transfer of mud or wastes onto adjacent streets or other areas. If wheel treads contain significant quantities of site soils the contractor will manually remove and dispose in stockpiles.

9.10.2 Traffic Control

The Principal Contractor shall supply signs and safety cones; erect at the appropriate entry and exit points; and maintain these devices in good condition. Excavation works, stockpiles and other hazards, shall be individually barricaded at all times. The site will be fully fenced to exclude public.

9.10.3 Refuse Disposal

All site refuse, including food, equipment wrappings, unused materials, etc. shall be handled and disposed of appropriately into a skip.

9.10.4 Site Security

The site shall be secured by a lockable fence around the perimeter of the site and access to the site will be restricted. All excavations and above-ground remediation equipment will be barricaded with reflective barricades, with pertinent reflective signage. Keys to the gate will be restricted to approved personnel.

Current fencing around the perimeter of the site is in reasonable condition and considered secure in consideration of the current land use. The access point at Yellow Rock Road is secured by a locked gate.

9.10.5 Training

Low environmental awareness of site workers may result in environmental impact including cross contamination of soil layers and off-site movement of contaminated soil. Accordingly, staff awareness training, inductions and daily toolbox meetings shall be conducted by the Principal Contractor with assistance from the Client and Site Environmental Supervisor.

9.10.6 Roles and Responsibilities

9.10.6.1 Client

A summary of the client's role and responsibilities includes:

- Overall responsibility for the project development and outcomes of the RAP
- Liaison with neighbours and other stakeholders
- Engagement of environmental management consultant to oversee implementation of the RAP
- Engagement of contractors to perform further investigation works, and any subsequent contaminated soil disposal and site rehabilitation works as required

- Provision of health and safety measures for site personnel and the works area
- Maintain relevant records associated with the RAP.

9.10.6.2 Site Environmental Supervision

A Site Environmental Supervisor, who is an experienced environmental scientist familiar with the implementation of environmental controls, will be appointed to take responsibility for implementation of this RAP at the Site during excavation of impacted soils. The Site Supervisor's duties include:

- Regular inspection of the site and site activities
- Completion of the daily reporting sheet
- Provision of on-site advice and direction with regard to implementation and compliance with the RAP
- Liaison with site personnel/contractors and the client regarding progress of works
- Provide and maintain a photographic record of works and results
- Identification, reporting and management of the rectification of any non-conformances with the RAP.

9.10.6.3 Principal Contractor

The principal contractor engaged for the management of impacted soils must:

- Undertake all works in compliance with the provisions of the RAP
- Liaison with site supervisor regarding progress of works
- Report any environmental incidents and unexpected finds to the site supervisor
- Collate all project documentation including landfill disposal dockets (where relevant)
- Conduct works in accordance with the Site OH&S plan.

10 Occupational Health and Safety

10.1 OHS Planning and Preparation

Prior to mobilising to complete the remedial works, the Principal Contractor and appointed remedial contractor will develop site and project specific Health and Safety Plans (HSPs), Safe Work Method Statements and Job Safety Analyses for the scope of works to be undertaken. The OHS documentation will detail measures to mitigate potential risks to site workers, third parties and the local environment during the remedial works. General, minimal OHS procedures to be implemented during the remedial works are outlined as follows:

- Potential contamination has been identified as non-volatile, thus under ambient conditions there is low potential for exposure to contaminants via inhalation. However, respirators and dust masks should be available on site should conditions arise that create a potential localised exposure to site staff;
- Potential exposure pathways for contaminants include dermal absorption (skin contact, ingestion) of dust. All workers should wear long sleeve trousers/shirts on-site. Gloves and safety glasses shall be worn by all workers involved in handling of potentially contaminated soils;
- Protective footwear (steel capped boots) to be worn on site at all times;
- Hearing protection should be worn during soil removal activities (or when working in the vicinity of heavy plant/machinery);
- Unauthorised access should be limited by ensuring that security gates are locked at the completion of each day's work;
- Excavations greater than 1.5m depth need to be "stepped" by the appointed civil contractor;
- Personnel are not to enter excavations (>1m depth) at any time; and
- PPE shall be provided in sufficient quantities to provide for the duties of each on-site individual.

10.2 Incident Management Plan

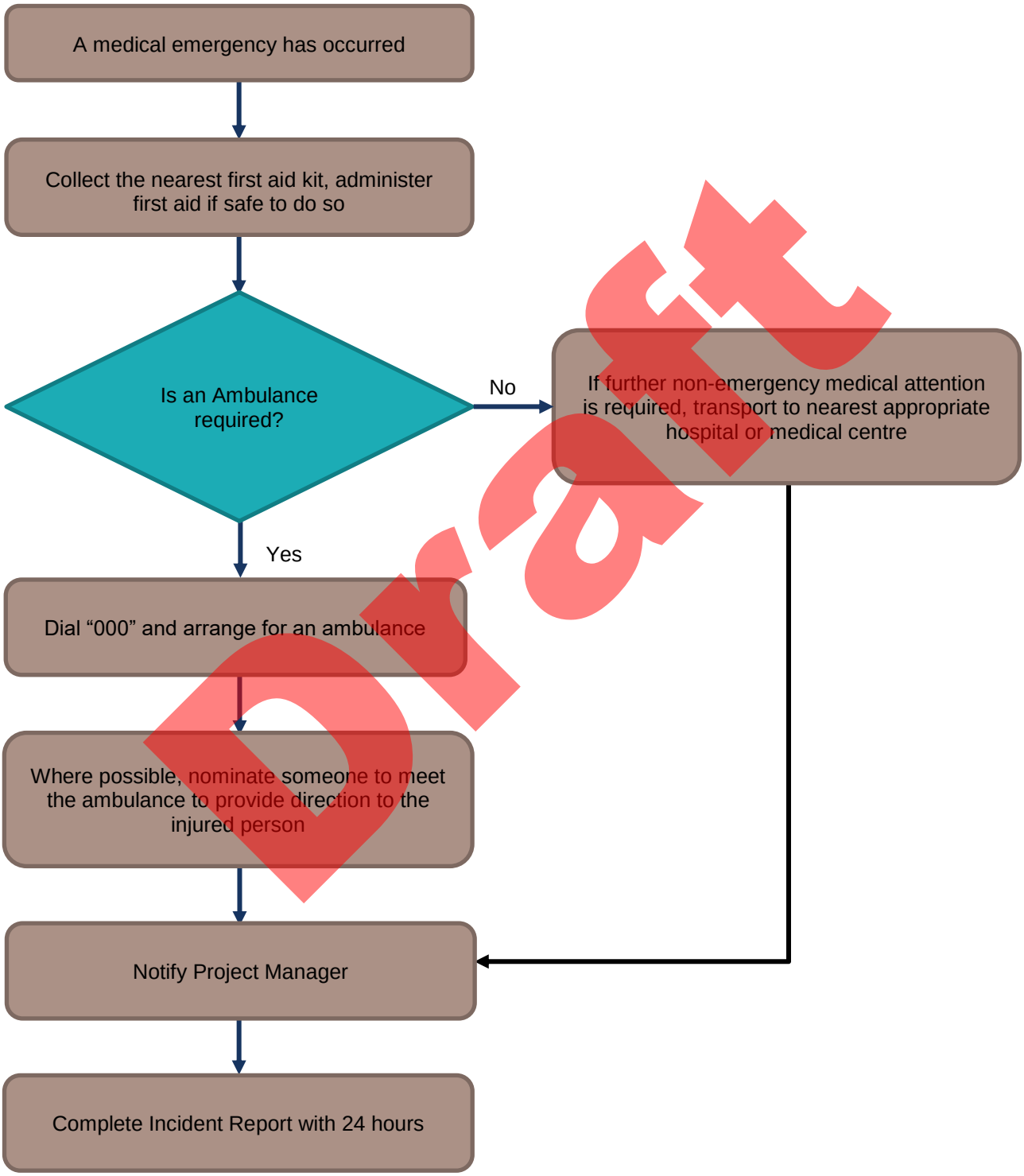
Emergency response includes pre-emergency planning, lines of authority and communication, emergency recognition and prevention, site control, evacuation routes, decontamination and first aid.

10.2.1 Medical Emergency/Serious Injury

In the event of an accident or an emergency situation involving a serious injury or medical emergency, immediate action must be taken by the first person to recognise the event (refer to flowchart below).

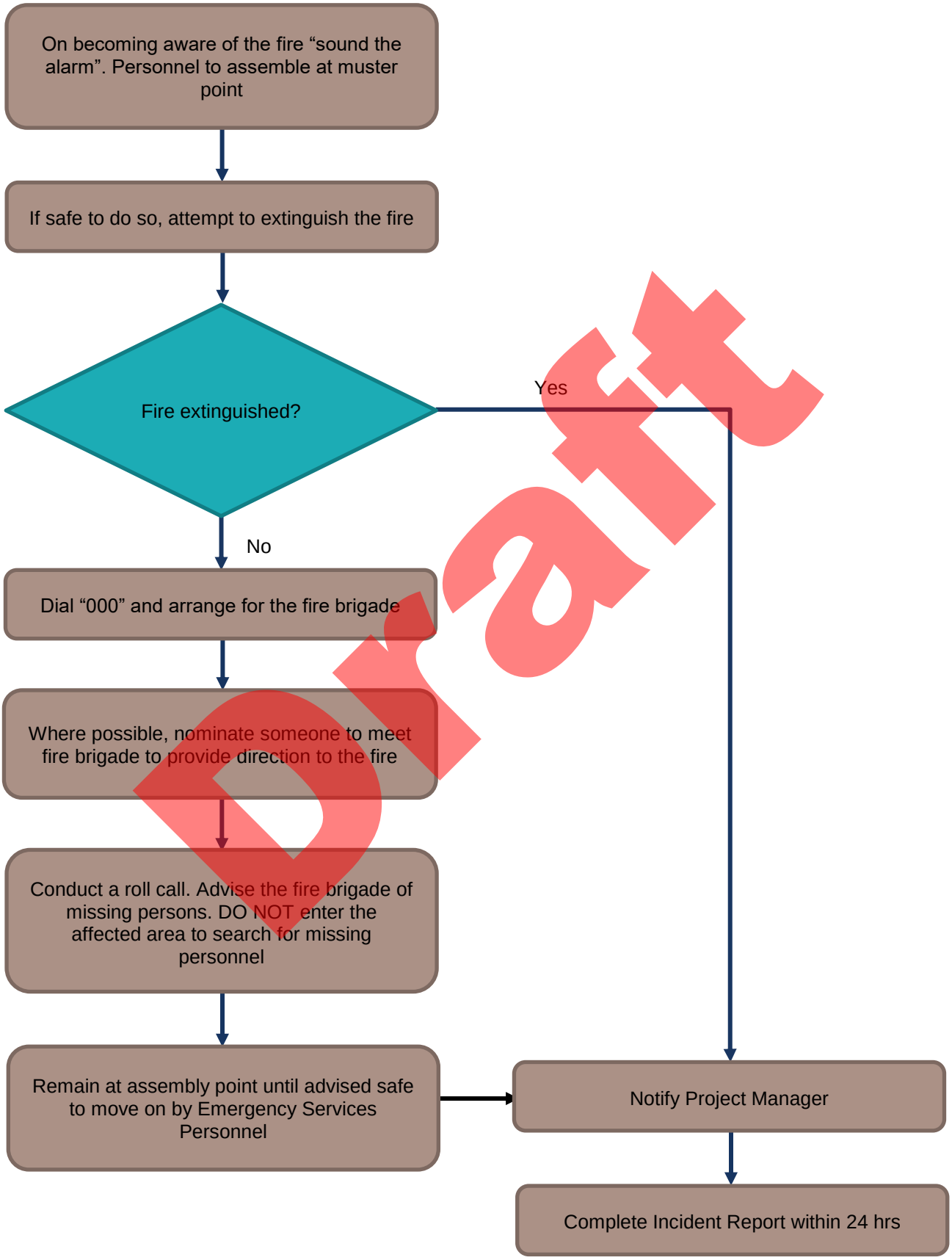
A portable and fully-stocked first aid kit shall be retained on site at all times.

In the event of a fatality, the Police, Site Manager, and Project Manager shall be notified immediately.



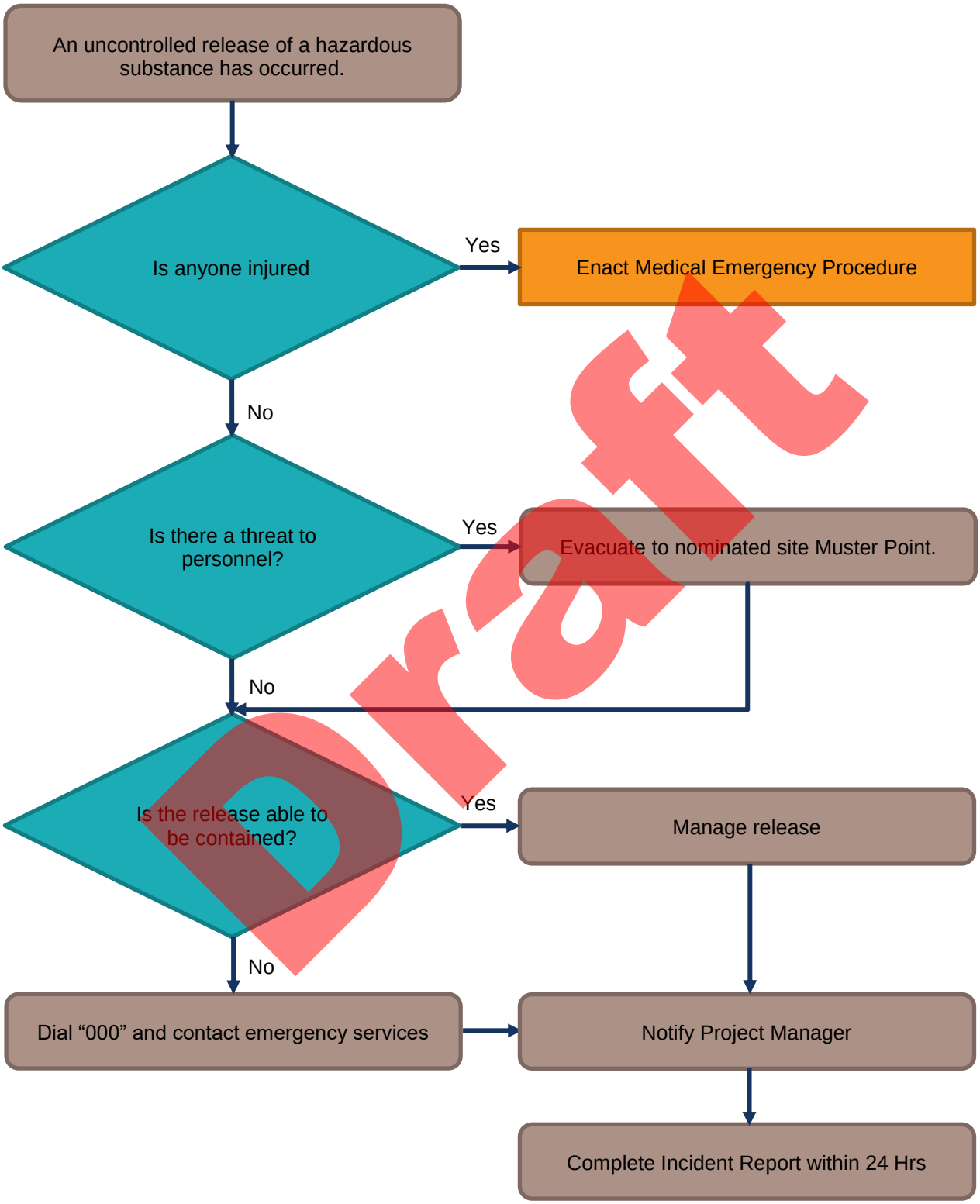
10.2.2 Fire

In the event of a fire, the actions outlined in below shall be taken:



10.2.3 Environmental Incident

In the event of an environmental incident, the actions outlined below shall be taken:



10.3 Incident Reporting

Principal employees and sub-contractors are required to verbally report incidents, accidents and near-misses to the Project Manager immediately after an event has occurred. It is the responsibility of the Project Manger to notify the Client Representative immediately after the occurrence of an incident and to complete a written incident report within 24 hours including notification to appropriate individuals and authorities (i.e. HSE and Management teams, SafeWork NSW and NSW EPA). Additional investigations may be necessary should a serious incident occur.

10.4 Community Consultation

Cardno does not anticipate that significant community consultation will be required during the course of the remedial and validation works. Should this assumption change, a detailed Community Consultation Plan may be developed to manage communications with third parties.

11 Regulatory Approvals/Licences

11.1 Regulatory Compliance Requirements

Regulations and sources of regulatory guidance relevant to this remediation programme relate to waste management, environment protection and occupational health and safety.

11.1.1 Waste Management

The remediation program must comply with the following legislation and policies

- *Waste Avoidance and Resource Recovery Act 2001*
- *Protection of the Environment Operations (waste) Regulation 2005*
- NSW EPA (2014) *Waste Classification Guidelines*

11.1.2 Environmental Protection

The remediation of environmental media impacted with elevated contaminant concentrations, must be carried out in a manner compliant with national, state and local environmental regulations, including the

- Protection of the Environment Operations Act 1997
- State Environmental Planning Policy (SEPP) 55 – Remediation of Land
- Contaminated Land Management Act 1997
- National Environmental Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013).

11.1.3 Planning Controls

Planning controls applicable to the proposed remediation are provided in the following:

- Canterbury Local Environmental Plan 2012
- State Environmental Planning Policy (SEPP) 55 – Remediation of Land

The proposed remedial works are to be managed as Category 2 remediation as per the SEPP 55 definition as the works are to be undertaken under existing approvals for the site development, with no specific development application required.

12 Conclusions

Cardno was engaged by HPG to prepare this Remediation Action Plan to guide the remediation of their site at 445-459 Canterbury Road, Campsie NSW during the construction of the proposed private hospital facility with two basement parking levels. Contamination onsite is limited to metals in exceedance of the ecological acceptance criteria and detectable quantities of TRH in groundwater. The identified contamination is not considered to impact site suitability for the proposed land use.

Due to the volume of material to be removed offsite, the proposed remediation methodology is offsite disposal of unsuitable material as waste followed removal of any further material as necessary with classification as ENM or VENM. If implemented as per the methodology outlined within this document the proposed remediation methodology will make the site suitable for the proposed land use with no ongoing management.

12.1 Recommendations

In addition to the action items outlined within this RAP the following recommendations are made:

- Undertake further sampling for delineation and classification of soil materials for offsite disposal as identified in Stages 2 and 3 or the Cardno SAQP (Cardno, 2020).
- Review and update this RAP as site information and plans change, including at the following points:
  - Completion of any further site investigations and sampling;
  - Approval and finalisation of the design; and
  - Engagement of the construction civil and earthworks contractor to determine any modifications to the proposed remedial methodology to ensure the objectives of the remediation can be met through construction.

13 References

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14 Limitations

This report has been prepared for the client, and their agents and the local council planning authority for the purpose of guiding and informing the remediation programme. Use of the report by other parties for different purposes shall be at their own risk. Whilst the assessment has used current industry practice to characterise the nature and extent of contamination at this site, and the author is satisfied with the quantity and quality of the information presented as the basis for this report, the Cardno cannot guarantee completeness or accuracy of any data, descriptions or conclusions based on information provided to it by others.

The agreed scope of this assessment has been limited for the current purposes of the Client. The remedial approach presented in this RAP may not remediate all types of contamination occurring in all areas of the site.

This Document has been provided by Cardno subject to the following limitations:

- This Document has been prepared for the particular purpose outlined in Cardno's proposal and no responsibility is accepted for the use of this Document, in whole or in part, in other contexts or for any other purpose;
- The scope and the period of Cardno's services are as described in Cardno's proposal, and are subject to restrictions and limitations. Cardno did not perform a complete assessment of all possible conditions or circumstances that may exist at the site;
- Conditions may exist which may limit the effectiveness of the proposed remedial approach, including geologic and hydrologic conditions, the presences of services or other underground infrastructure. Accordingly, more than one phase of remediation may be required to achieve the goals of this RAP;
- In addition, it is recognised that the passage of time affects the information and assessment provided in this Document. Cardno's opinions are based upon information that existed at the time of the production of the Document. It is understood that the services provided allowed Cardno to form no more than an opinion of the actual conditions of the site at the time this Document was prepared and cannot be used to assess the effect of any subsequent changes in the quality of the site, or its surroundings, or any laws or regulations.
- Where data supplied by the client or other external sources, including previous site investigation data, have been used, it has been assumed that the information is correct unless otherwise stated. No responsibility is accepted by Cardno for incomplete or inaccurate data supplied by others.
- Cardno may have retained sub consultants affiliated with Cardno to provide services for the benefit of Cardno. To the maximum extent allowed by law, the Client acknowledges and agrees it will not have any direct legal recourse to, and waives any claim, demand, or cause of action against, Cardno's affiliated companies, and their employees, officers and directors.

This RAP is not any of the following:

- A Site Audit Report or Site Audit Statement as defined under the *Contaminated Land Management Act, 1997*;
- A Detailed ESA or Environmental Site Investigation sufficient for an Environmental Auditor to be able to conclude a Site Audit Report and Site Audit Statement;
- A detailed hydrogeological assessment in conformance with NSW DEC (2007) Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination;
- An assessment of groundwater contaminants potentially arising from other sites or sources nearby;
- A total assessment of the site to determine suitability of the entire parcel of land at the site for one or more beneficial uses of land.

APPENDIX A

FIGURES

HPG AUSTRALIA

Location Plan

453-459 CANTERBURY ROAD, CAMPSIE NSW

Legend

- Site Boundary
- Railway Station (NSW SS)
- Distance Buffer
- Major Road (NSW SS)
- Local Road (NSW SS)
- Major Watercourses (LPI)
- Railway (NSW SS)

Land Use (ABS, 2016)

- Other
- Commercial
- Education
- Hospital/Medical
- Industrial
- Parkland
- Primary Production
- Residential
- Water

FIGURE 1

1:35,000 Scale at A3

km
0 0.5 1 1.5 2

N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (NW&E)
Date: 2020-11-09 | Project: NE30028
Coordinate System: GDA 1994 MGA Zone 56
Map: NE30028-GS-005-LocationPlan.mxd 01
Basemap supplied by Esri and other thrid party suppliers

Site Plan

453-459 CANTERBURY ROAD, CAMPSIE NSW

Legend

- Site Boundary
- Groundwater Contours (mAHD)
- Inferred Groundwater Flow Direction
- 1m Contours (LPI LiDAR, 2013)
- Potential Waste Oil UST
- Approximate Area of UST Impact
- Basement Excavation Footprint
- Cadastre (NSW SS, 2019)

FIGURE 2

1:400 Scale at A3

m
0 5 10 15 20

Map Produced by Cardno NSW/ACT Pty Ltd (NW&E)
Date: 2021-05-13 | Project: NE30028
Coordinate System: GDA 1994 MGA Zone 56
Map: NE30028-GS-003-SiteMap.mxd 02
Aerial imagery supplied by Nearmap (April. 2021)

HPG AUSTRALIA

Sample and Monitoring Locations

453-459 CANTERBURY ROAD, CAMPSIE NSW

Legend

- Site Boundary
- Proposed Test Pit
- Groundwater Monitoring Wells (Cardno, 2017 & 2020)
- Approximate Area of UST Impact
- Potential Waste Oil UST
- Basement Excavation Footprint
- Cadastre (NSW SS, 2019)

Existing Sample Locations (Cardno, 2017 & 2020)

- Bore Sample Location
- Soil Bore to be Reassessed as Test pit

FIGURE 3

1:400 Scale at A3

m
0 5 10 15 20

N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (NW&E)
Date: 2021-05-13 | Project: NE30028
Coordinate System: GDA 1994 MGA Zone 56
Map: NE30028-GS-002-SampleLocation.mxd 02
Aerial imagery supplied by Nearmap (April. 2021)

APPENDIX

B

PLANNED DEVELOPMENT

445-459 Canterbury Road Campsie - CONCEPT DESIGN

445-459 Canterbury Road Campsie - CONCEPT DESIGN

HPG propose (the Proposal) to deliver a modern significant health facility at the site. The final health services configuration of the site will reflect the services most needed in the region, and it is expected that the facility will provide a range of high-quality medical care including inpatient and outpatient services. These may include emergency and intensive care, maternity, day surgery, cardiac care, dialysis and oncology.

With the exception of a day surgery, HPG have identified that there are no acute or sub-acute private hospitals in the Canterbury Bankstown Local Government Area (LGA). At this time there are no private acute facilities servicing the LGA, with the nearest facilities being located in the Inner West and Georges River Council areas.

Canterbury Bankstown's large, diverse and growing population requires access to a broader range of elective private medical services which would be supported by the facility. The site is well placed to support this type of facility and aligns with Council's strategic plans to build the Eastern Lifestyle and Medical Precinct by supporting Canterbury Hospital by locating complementary medical facilities in the centre.

We consider the site as a catalyst opportunity for the renewal of Canterbury road and an opportunity to stimulate the development of the area as a medical precinct in line with council's objectives within the LSPS, and the current zoning controls. It would support the creation of high knowledge jobs in Health Care and Social Assistance, an industry anticipated to be the largest provider of jobs in the Canterbury Bankstown LGA by 2036 and help Campsie achieving its goal of 7,000 jobs by 2036 as outlined in the South District Plan.


LIBRARY
FAMILY MEDICAL CENTRE
FIRE STATION
PEARL DENTAL CLINIC
PETER MOORE FIELD
BEAMISH STREET
STANLEY STREET
PERRY STREET
CANTERBURY ROAD
SITE
CANTERBURY SOUTH PUBLIC SCHOOL
ROBERTSON STREET
SCAHILL STREET
CANTERBURY HOSPITAL
PAT O'CONOR RESERVE
CLEMTON PARK MEDICAL CENTRE

Key Characteristics

Based on the analysis conducted, the main characteristics as seen in Public and Private Hospitals are as follows:

- Mainly located along an arterial/main road
- The number of storeys vary from 3 to 8
- Close proximity to public transport and within 500m to 750m from the train station
- Located within walking distances ranging from 320m to 650m from the Town Centre
- Maintaining connections with the Public Hospital (distances ranging between 200m to 650m)
- Generally located within a larger hospital precinct with a number of supporting private hospital facilities
- Well integrated road network enhances the connections to the surroundings
- Located close to the NSW Ambulance (distances ranging between 350m to 740m)
- At grade and multi-storey parking facilities in close proximity ranging from 80m to 240m
- Surrounded by supporting residential uses

Other considerations include:

- Opportunities for the inclusion of education facilities including schools, TAFE and other private universities
- Provision of child care centres in the surroundings varying from 2 to 10 in number depending on the requirement
- Accommodation and lodging facilities

The main characteristics of the subject site are as follows:

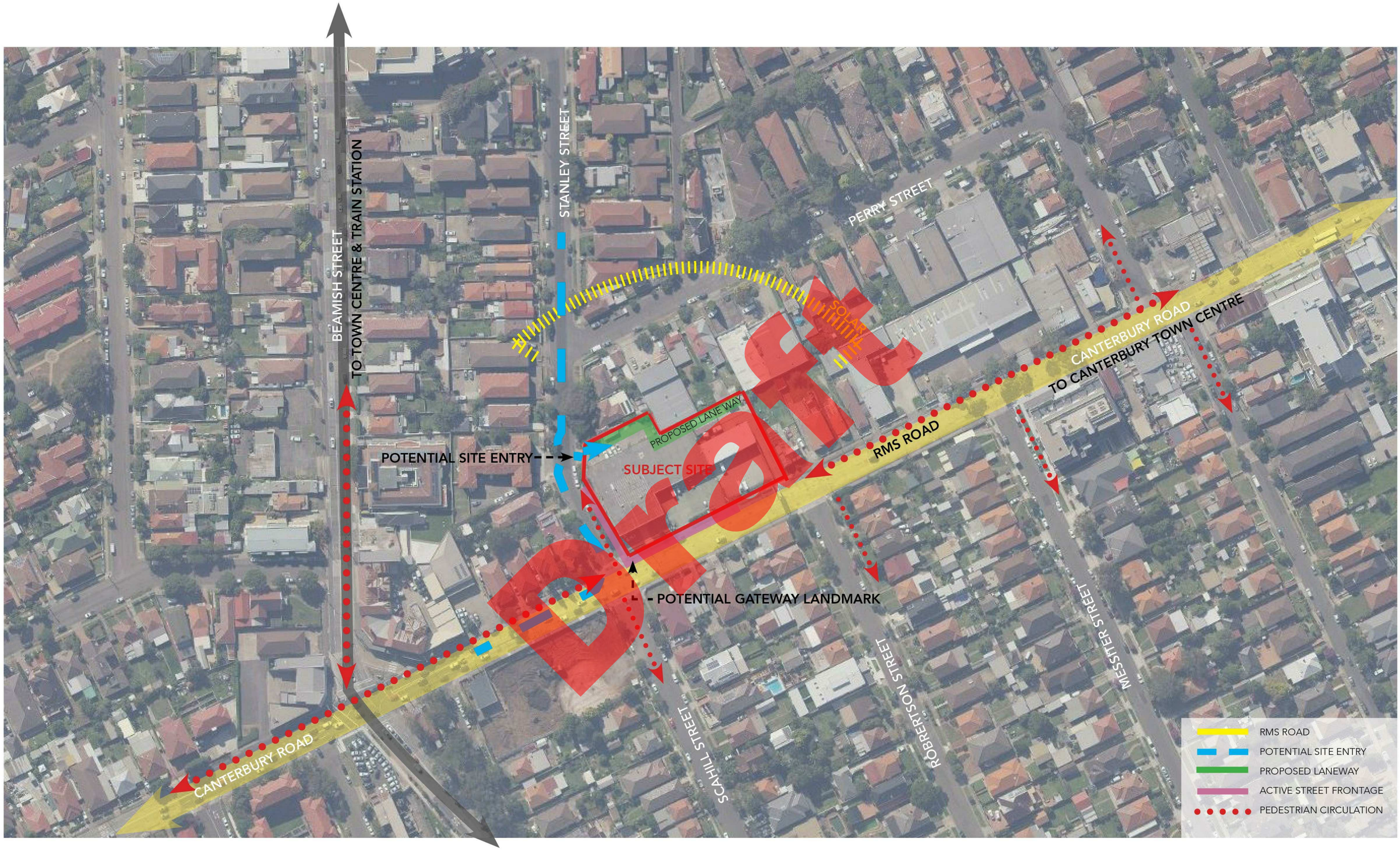
- Located along the main road
- 700m away from the nearest Public Hospital
- Close proximity to public transport and within 780m from the Campsie Station
- Located within walking distance from the Town Centre and commercial/retail facilities
- Surrounded by a number of supporting private medical facilities
- Schools located at a distance of 520m
- 700m away from the NSW Ambulance

1. View Between Canterbury Rd & Stanley St

2. View Along Canterbury Rd

3. View Along Stanley Street


BEAMISH STREET
STANLEY STREET
PERRY STREET
CANTERBURY ROAD
1.
2.
SUBJECT SITE
3.
CANTERBURY ROAD
SCAHILL STREET
ROBERTSON STREET
WESSLER STREET
Draft
1. POTENTIAL VIEW TOWARDS CAMPSIE TOWNCENTRE
2. POTENTIAL VIEW TOWARDS SYDNEY CBD SKYLINE AT HIGH LEVEL
3. UNOBSTRUCTED VIEW BEYOND



Existing Site Analysis - Traffic

445-459 Canterbury Road, Campsie

HPG AUSTRALIA Property Lifestyle Partnership

TEAM ARCHITECTS

Existing Site Analysis - Environmental Factors

445-459 Canterbury Road, Campsie

Kolling Building for Research & Education is the first completed project within the redevelopment of the entire Royal North Shore Campus. It is the main centre for biomedical research and has a capacity to accommodate 500 researchers.

Ground to level 3 consist of education space that is physically and visually connected through a spiral stair within the central void. This education space includes 3 lecture theatres and 12 tutorial rooms. While levels 4 to 10 consist of certified laboratory and support spaces to the south; office, meeting and write up spaces to the north. The foot print for each floor is approx. 1550sqm.

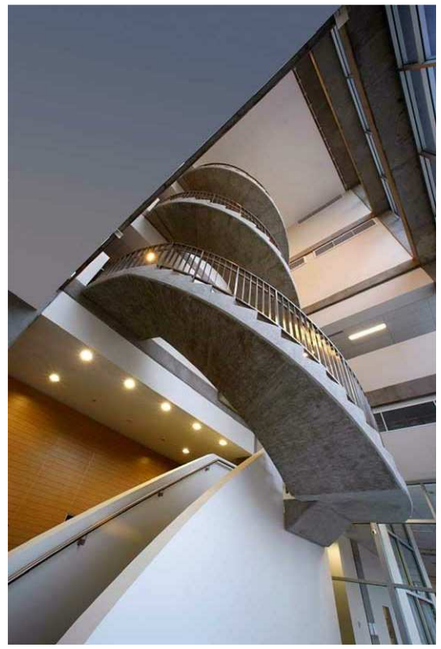
The facility opened in late 2008 and it has since provided a consolidation of high quality clinical research and education.

FORM:

Floorplate – with a simple and direct building form it was planned on a series of horizontal floor plates and connected through strongly expressed circulation cores. The narrow floor plate provides access to natural light with sunshade screens dappling the light within

Height – sweeping views of the surroundings, built on the highest point on the hospital campus, establishing itself as a prominent marker point for the area

Wayfinding – connected physically and visually via staircase within a large void on the southern end of the building



Source : https://www.e-architect.co.uk/sydney/kolling-research-building

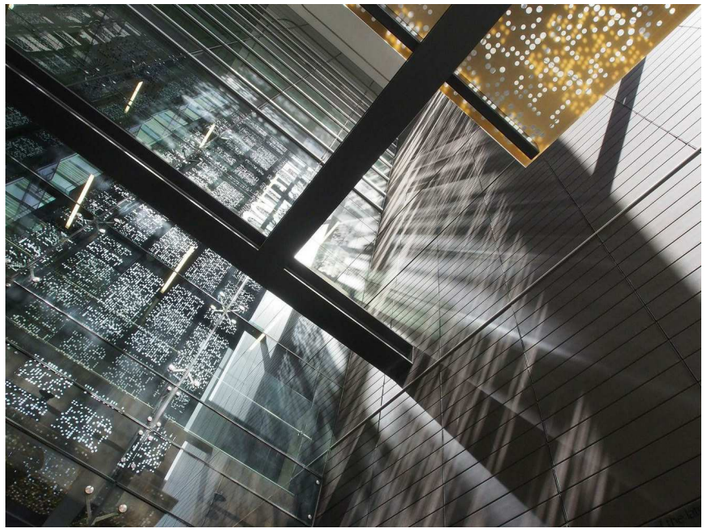
The Chris O'brien Lifehouse was completed in 2013 with an area of approximately 39 000 sqm, located in the suburb of Camperdown, NSW. By offering patients one stop needs, this facility has adopted an innovative approach by simplifying the patient's experience. Services includes ambulatory care, allied health, clinical trials, research, education, therapies and psycho-social facilities in a nine story vertical structure.

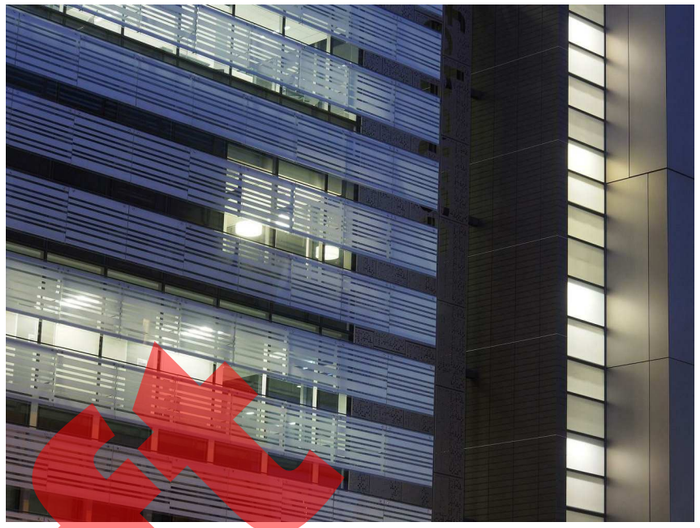
FORM:

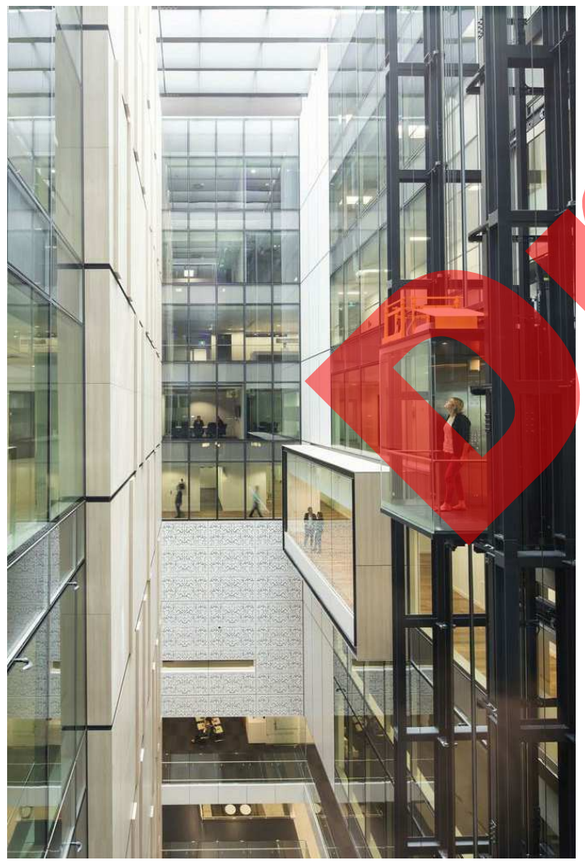
Floorplate – the narrow floorplate with a central atrium with vast skylight allow for visual and physical connectivity through as well as providing diffuse natural light throughout

Height – totalling 13 stories (2 basement parking, Lower Ground, Ground at street level and 9 stories above). The vertical structure of the building reflects directly upon its spatial configuration with ambulatory care facilities on lower level, followed by support zones while inpatients are located on the top two level of the facility. A total of 96 private rooms with access to private external courtyards and healing gardens to benefit from expansive views.

Wayfinding – the design focuses on intuitive wayfinding to support a positive experience for patients and staff to navigate the building. All spaces within the building revolve around a central atrium extending down through the building to the Lower ground floor







Source : https://www.archdaily.com/558365/chris-o-brien-lifehouse-hdr-rice-daubney

The Northern Beaches Hospital was completed in 2018, located in the suburb of Frenchs Forest, NSW with an area of approximately 70 000 sqm. Given the scale of the development, a sense of welcome for patients, families and staff was the key drive of the project; this was achieved through a play of scale, material, colour, texture and way finding.

The facility extends over 5 levels with state of the art technology and services includes the following: Emergency Unit, Intensive Care, High Dependency, Coronary Care, Day Surgery, Medical Imaging, Maternity, Special Care Nursery, Ambulatory Care, Public & Private Inpatient Units, Consulting Suites, Support & Administrative

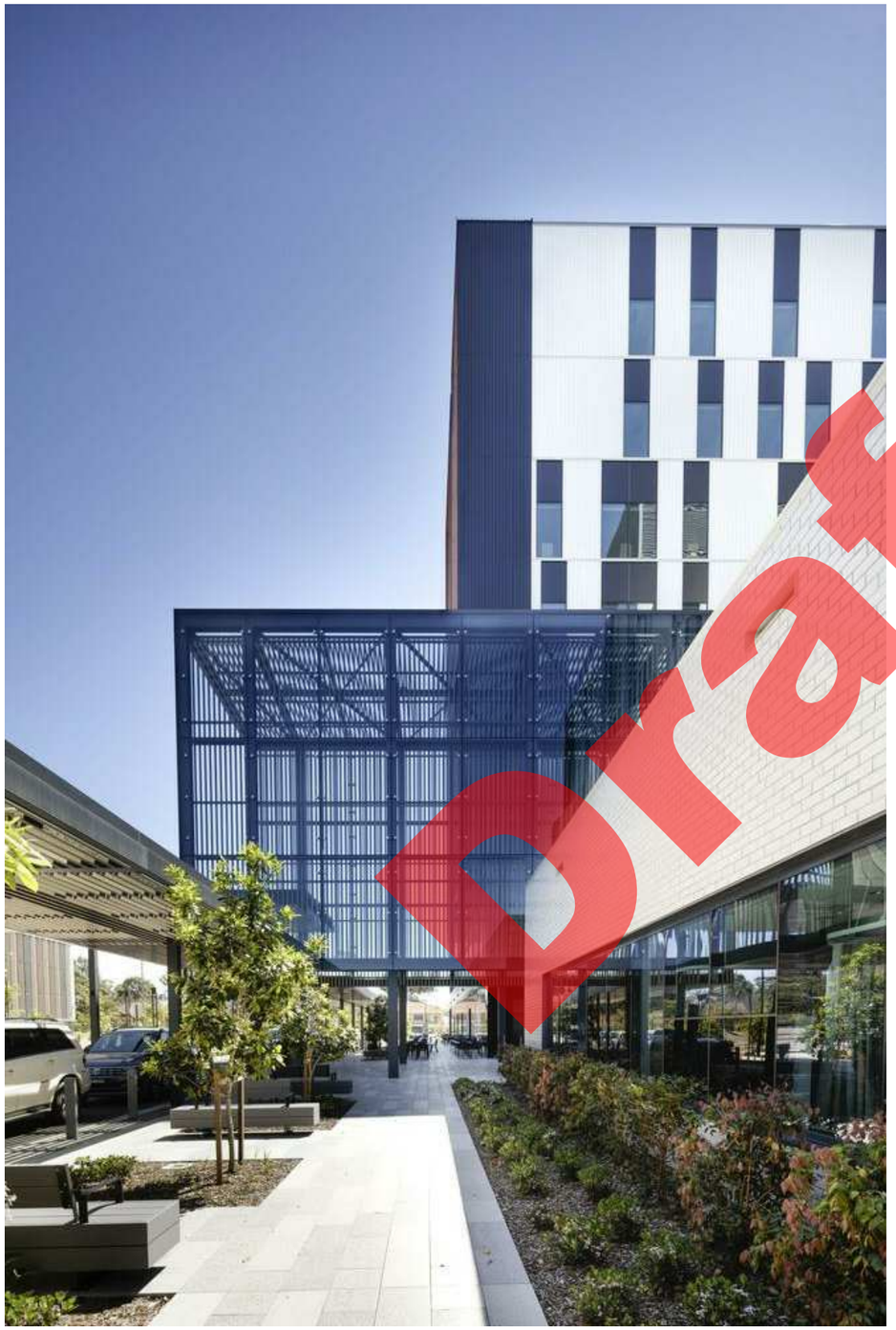
It is also the first hospital in NSW to achieve a 4 Star Green Star rating (design, build & operation)

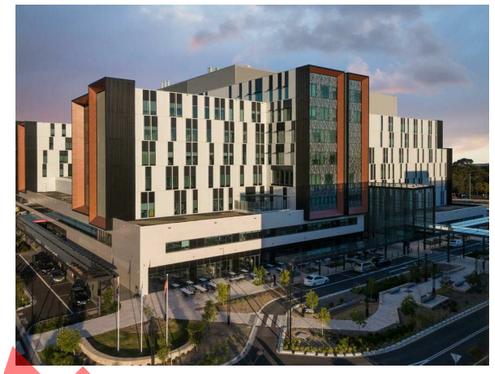
FORM:

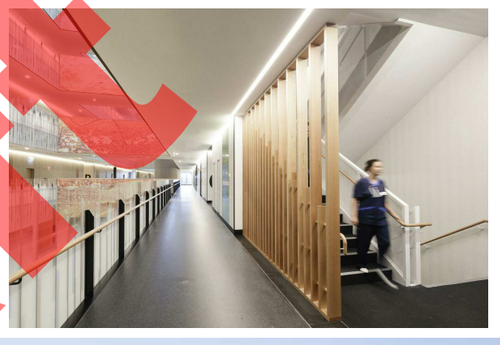
Floorplate - Wide square ground floor floorplate split down the centre by an extensive atrium, the floorplate splits into narrower segments as it rises in height and splitting the building into 2 wings for public and private inpatient wards, this creates a larger perimeter and access to natural light and views

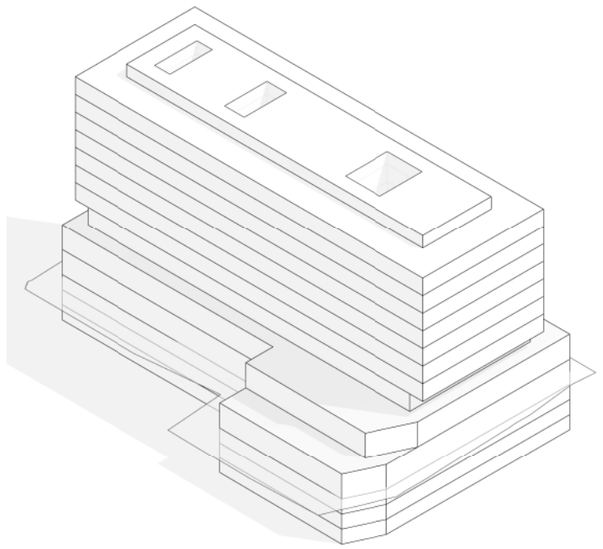
Height – totalling 8 stories (Ground at street level and 7 stories above) with the bulk of medical services such as theatres, recovery and imaging on the lower levels and the 488 beds and specialist consulting suites on the higher levels with access to views and natural light

Wayfinding – clarity in navigation was an important part of the design to reduce stress when entering a hospital. the main vertical circulation revolves around the central atrium allowing for glimpses of the staff and patient/visitor movement through the building with prominent views to the floors below





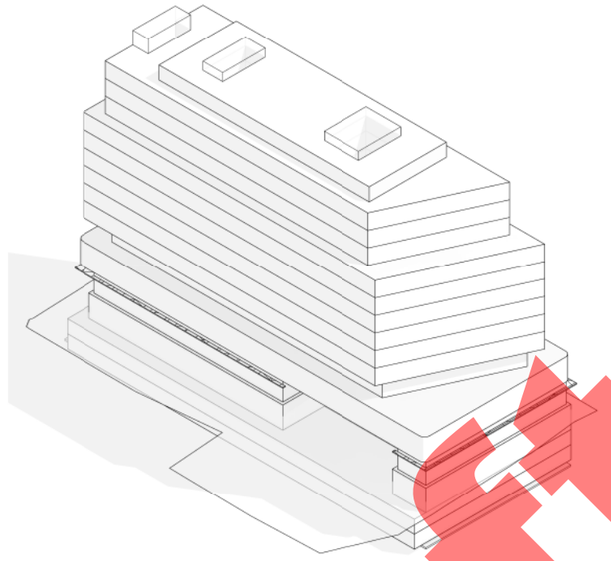




OPTION 1
Site: 4414m²

3 Levels of Basement Parking
1 Ground Floor
9 Levels above ground with plant

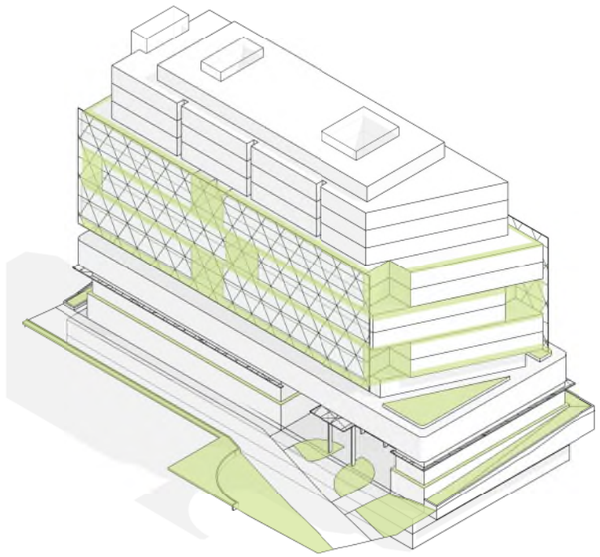
- No rear laneway
- Lower height
- Larger floor plates allows for larger medical unit/services across one level
- Larger floor plates reduces opportunities for natural light to penetrate
- Reduced connectivity for public through site



OPTION 2
Site: 4414m²

2 Levels of Basement Parking
2 Ground Floor levels, Upper and Lower
11 Levels above ground with plant

- New back laneway to Stanley St
- Increased public connectivity across site
- Narrow floor plate allows for better access to natural light across floor
- Increased setbacks in the North
- Reduced building bulk
- Floor plate size provides efficient staffing

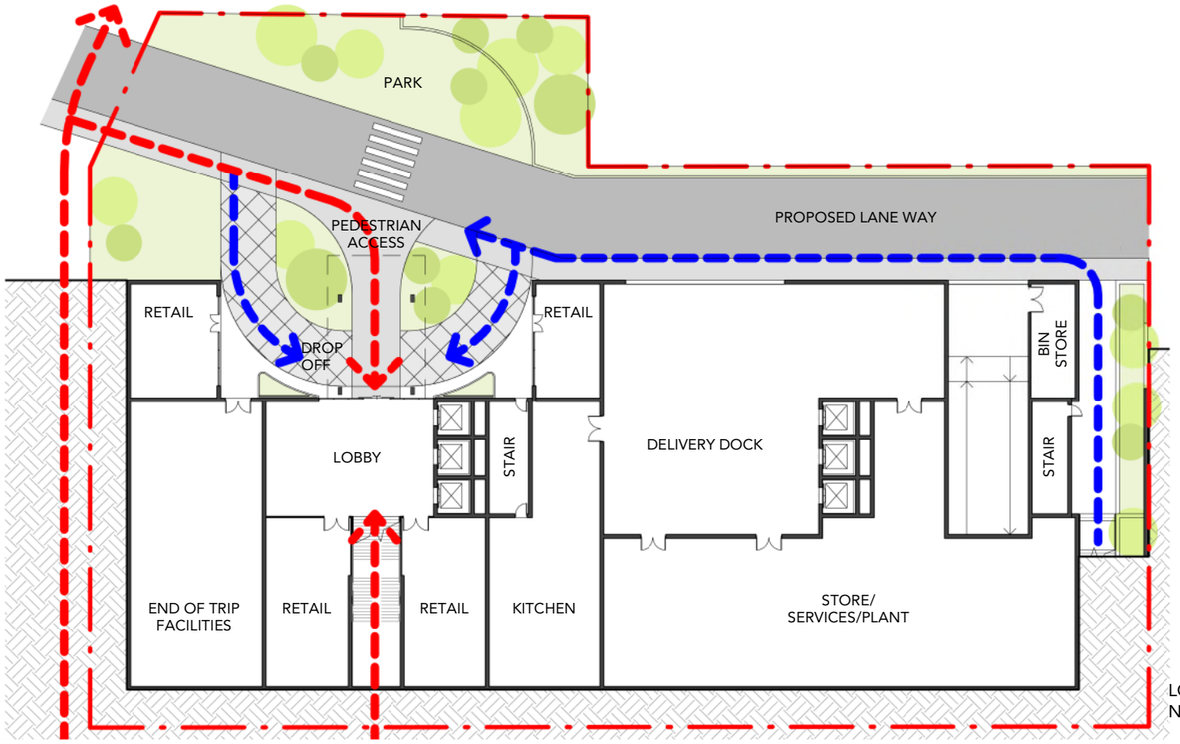


FORM:
Integrating elements from precendent studies:

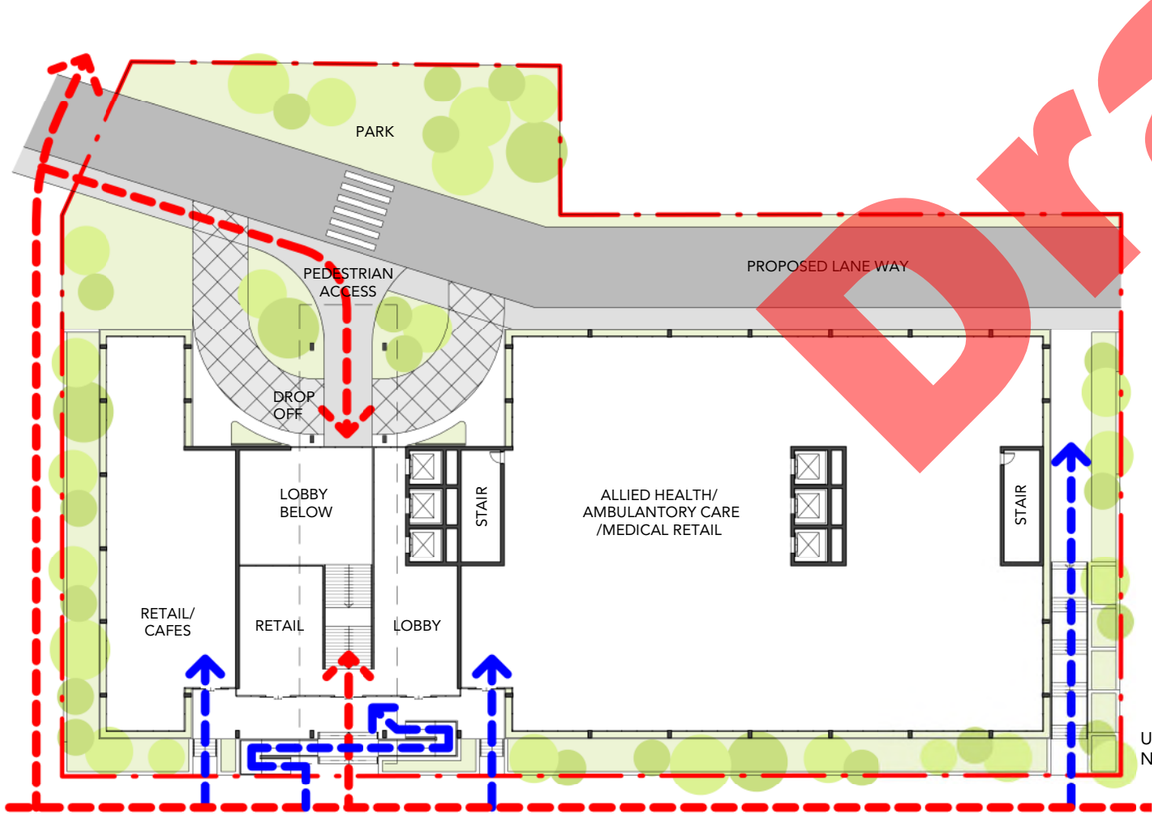
Floor plate – A narrow floorplate promotes spatial efficiency as the width is determined by spaces required within (theatres, ward rooms, etc.) rather than maximising footprint to site resulting in odd forms and awkward leftover spaces.
It also allows for natural light to penetrate throughout the building, helping to improve mood and healing, and creates a better working environment for staff.
While consolidating services the narrower floorplate and vertical transportation also reduces travel distance for sick patients and tired staff avoiding having to trek vast campuses.
It allows for new laneway on the site and maximising green spaces for public/neighbours' amenity, and the sky gardens cut into the facade provide healing spaces for patients, visitors and staff as well as calming visual points of interest for the public and neighbours.

Height – Opportunity for iconic building in the area – establishing as a prominent marker point for the area as a gateway building to new medical precinct in Campsie

Wayfinding – Signage and wayfinding is very important and the entry double height space on the ground levels provides a visual connection through the building and a simple narrow and consolidated floorplate and layout adds to ease of navigation.



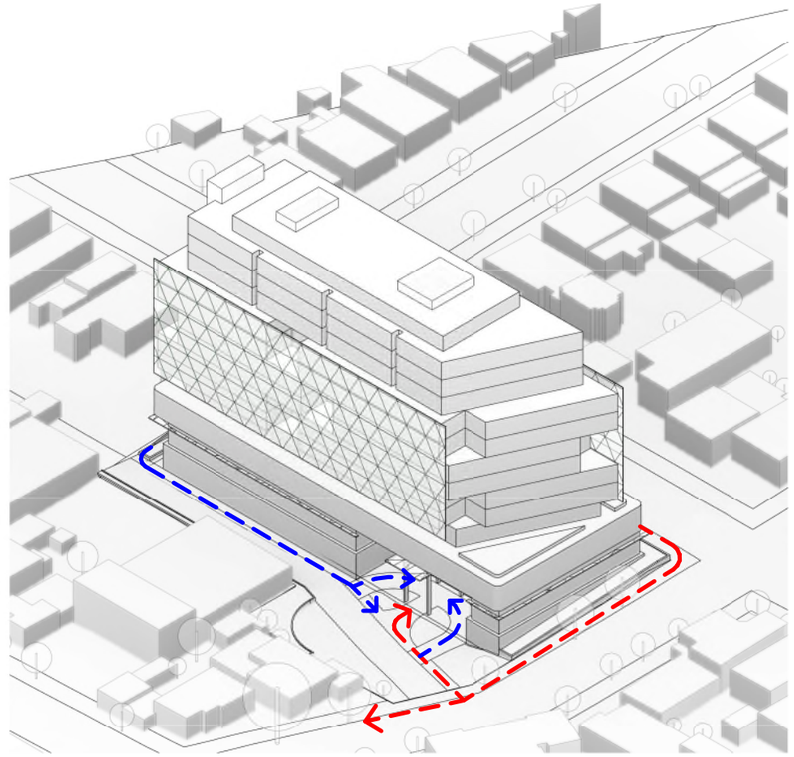
LOWER GROUND FLOOR PLAN
N.T.S

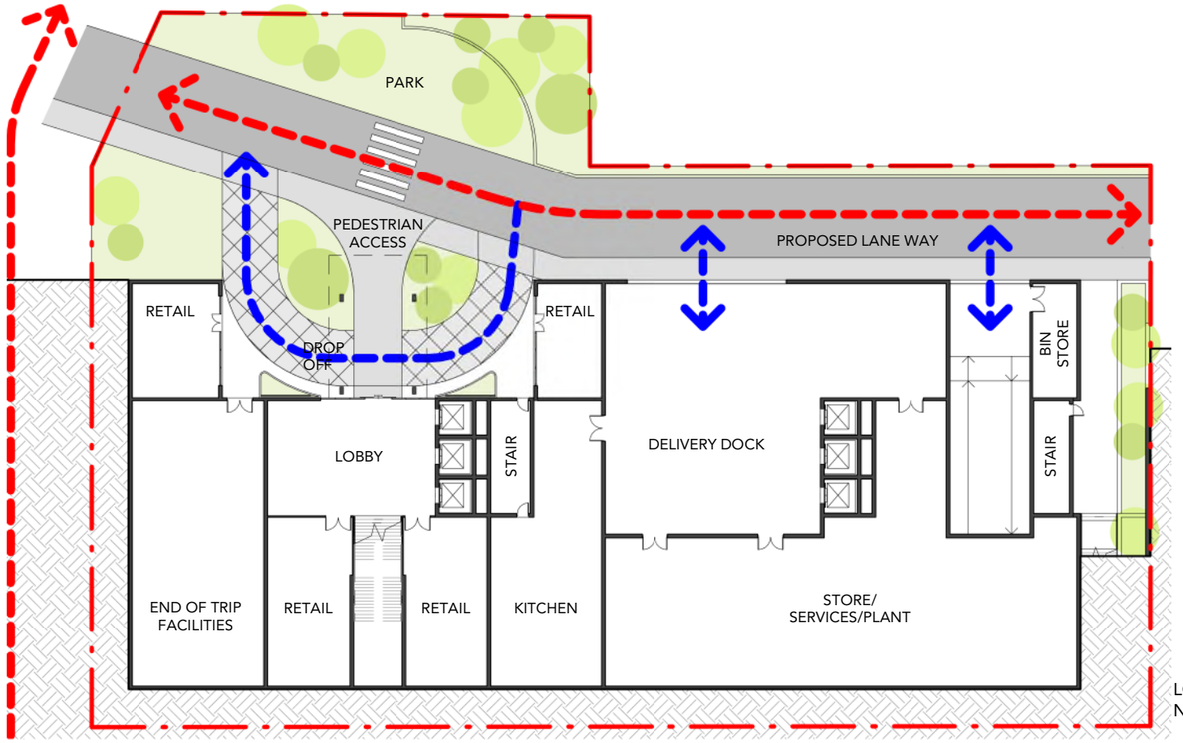


UPPER GROUND FLOOR PLAN
N.T.S

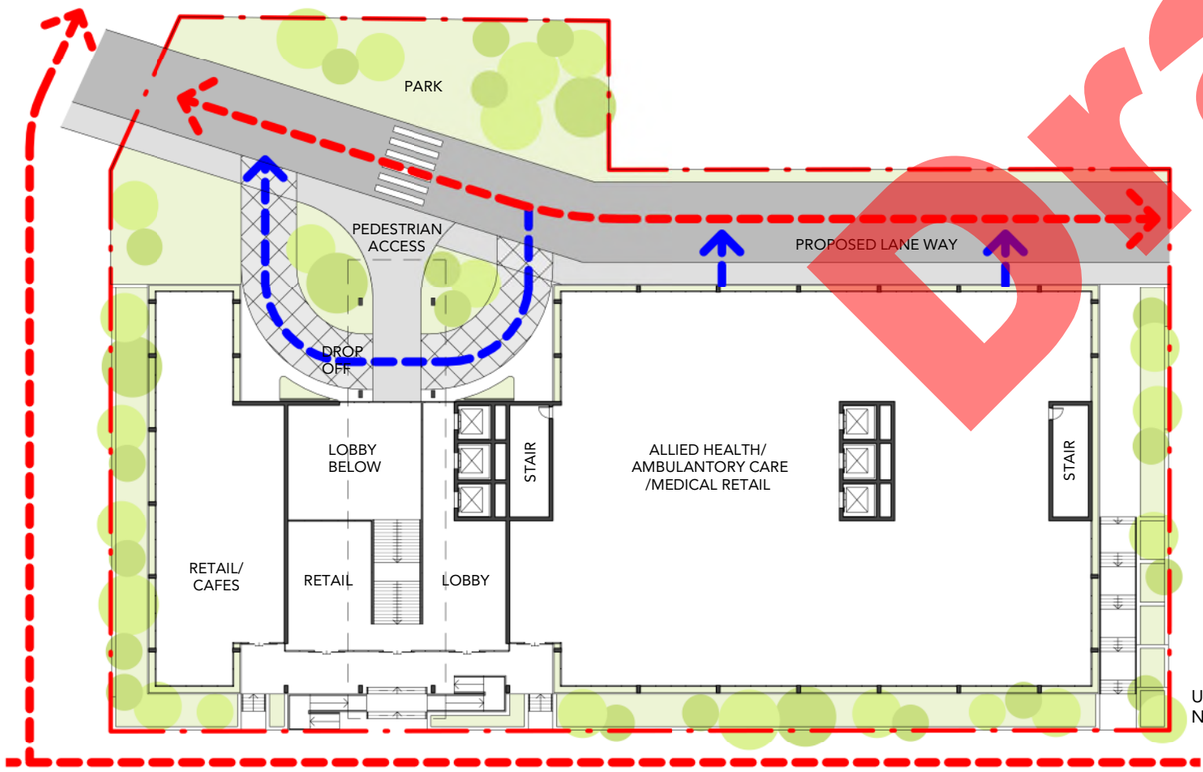
PRIMARY

SECONDARY





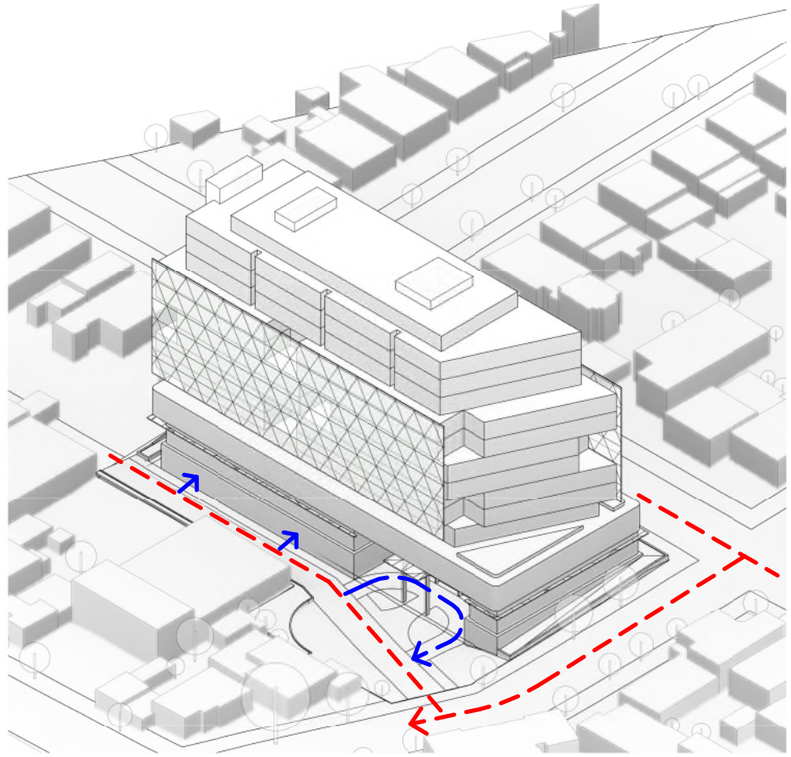
LOWER GROUND FLOOR PLAN
N.T.S

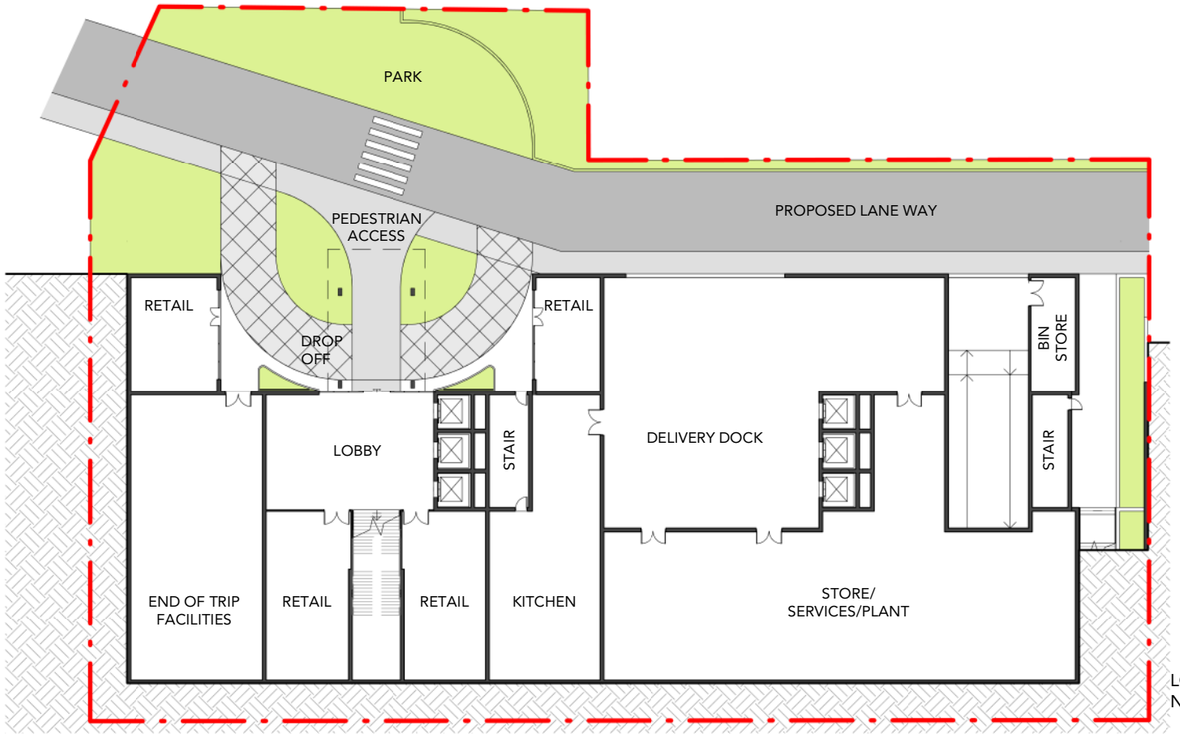


UPPER GROUND FLOOR PLAN
N.T.S

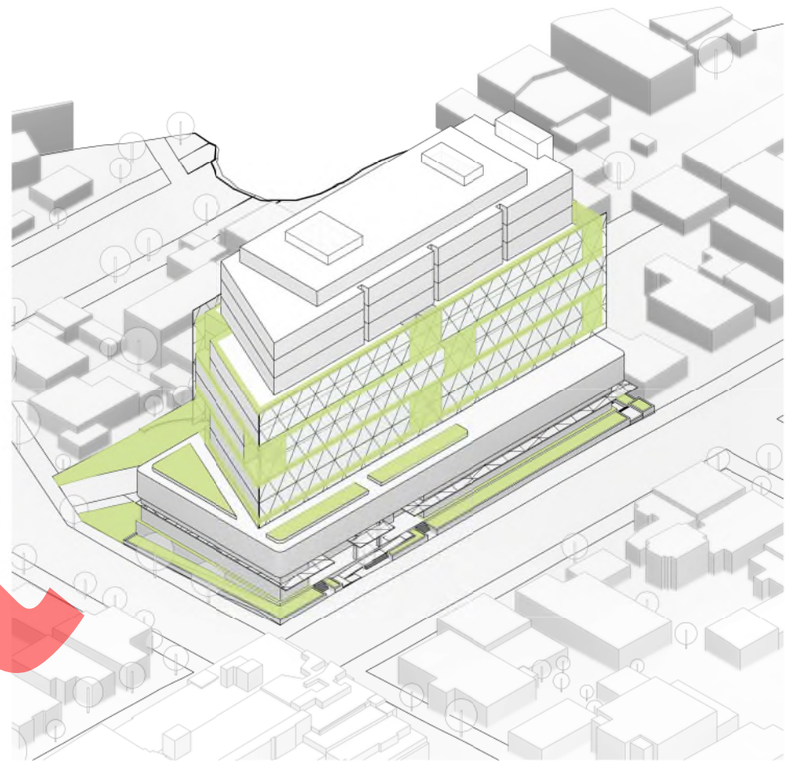
PRIMARY

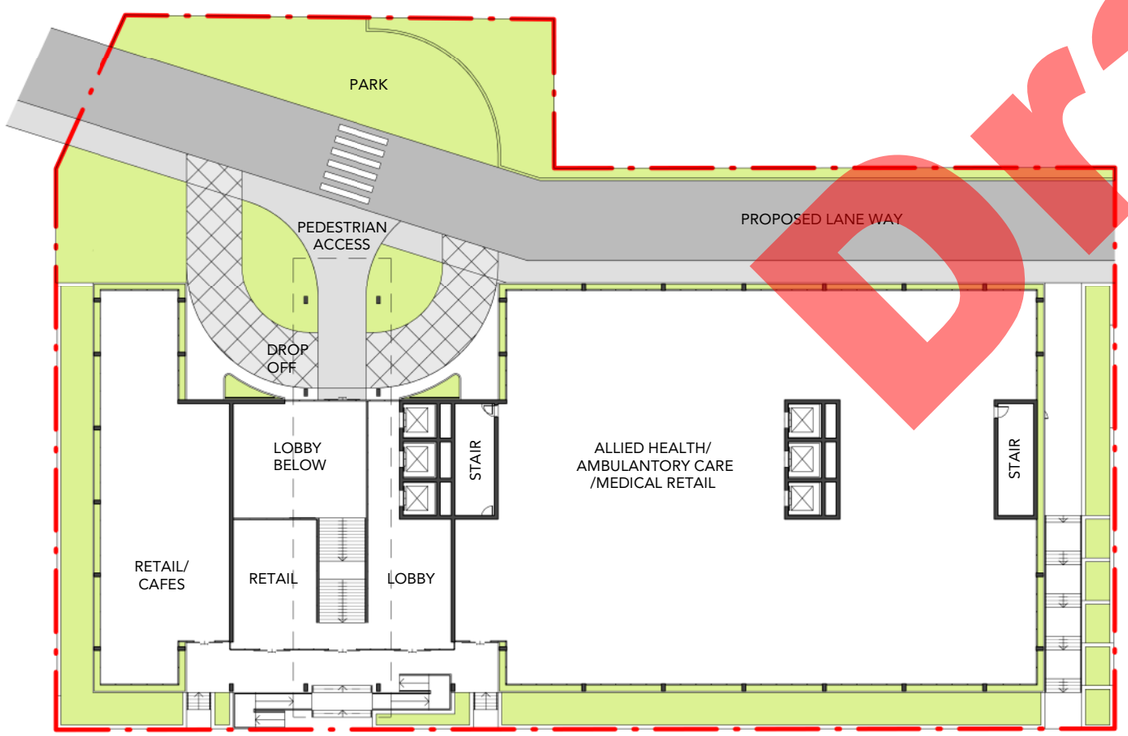
SECONDARY



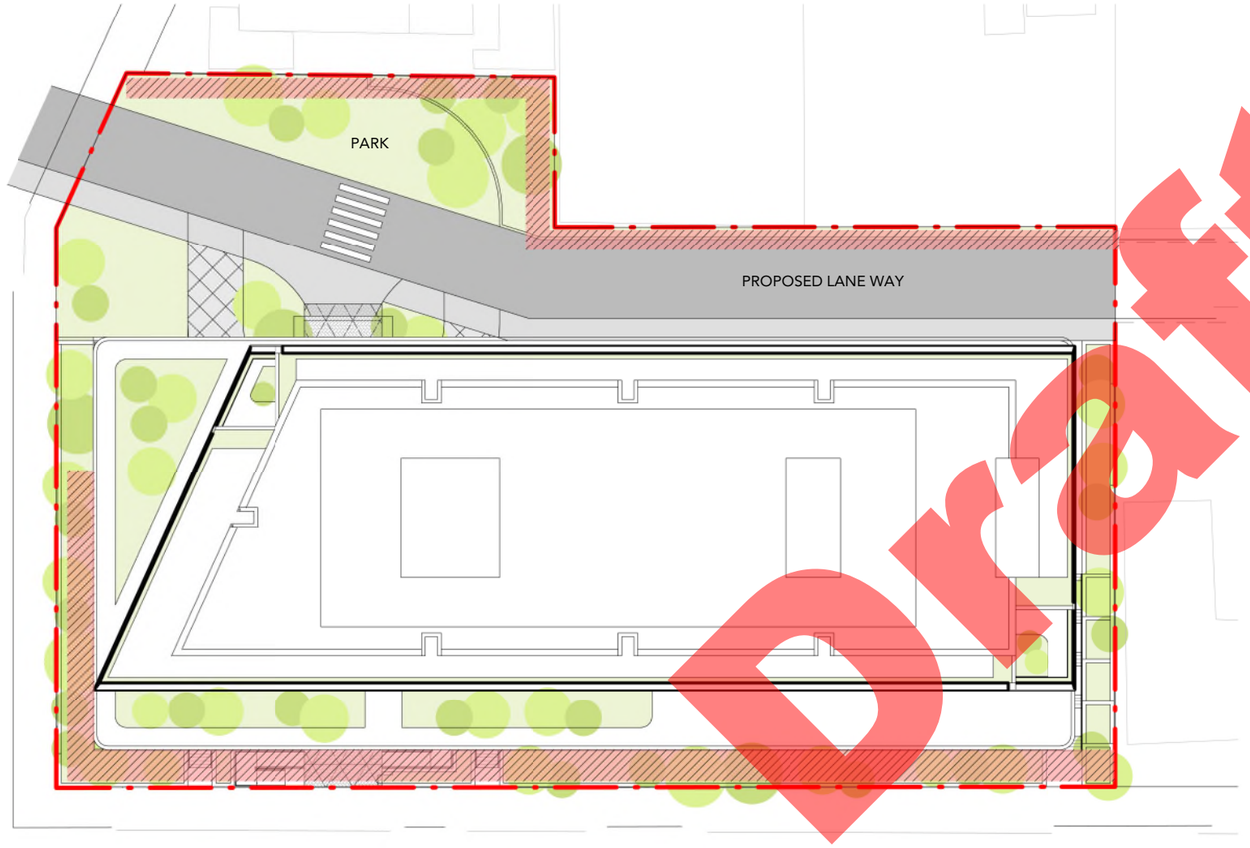


LOWER GROUND FLOOR PLAN
N.T.S

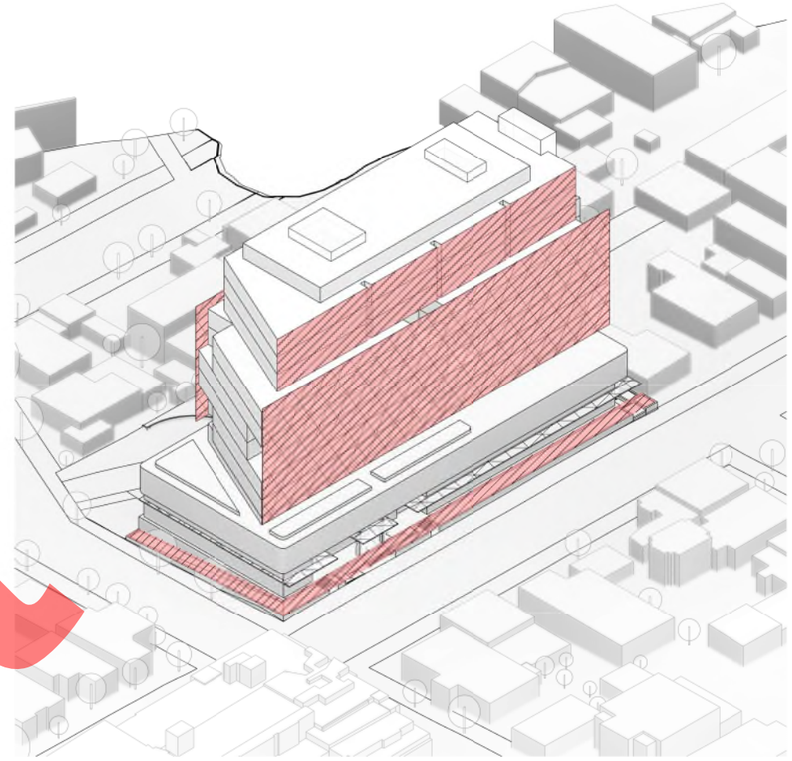


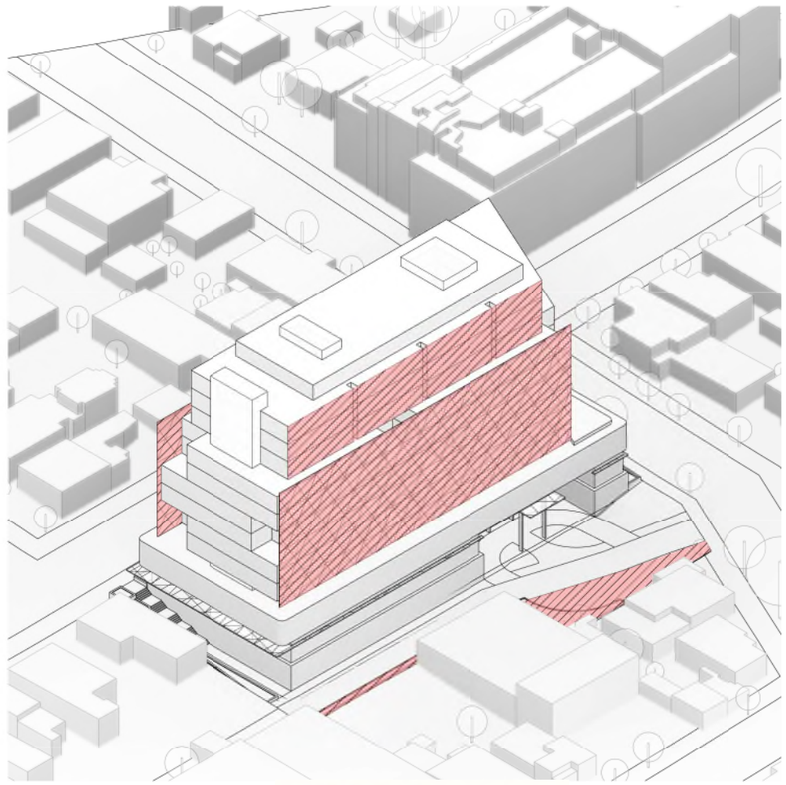


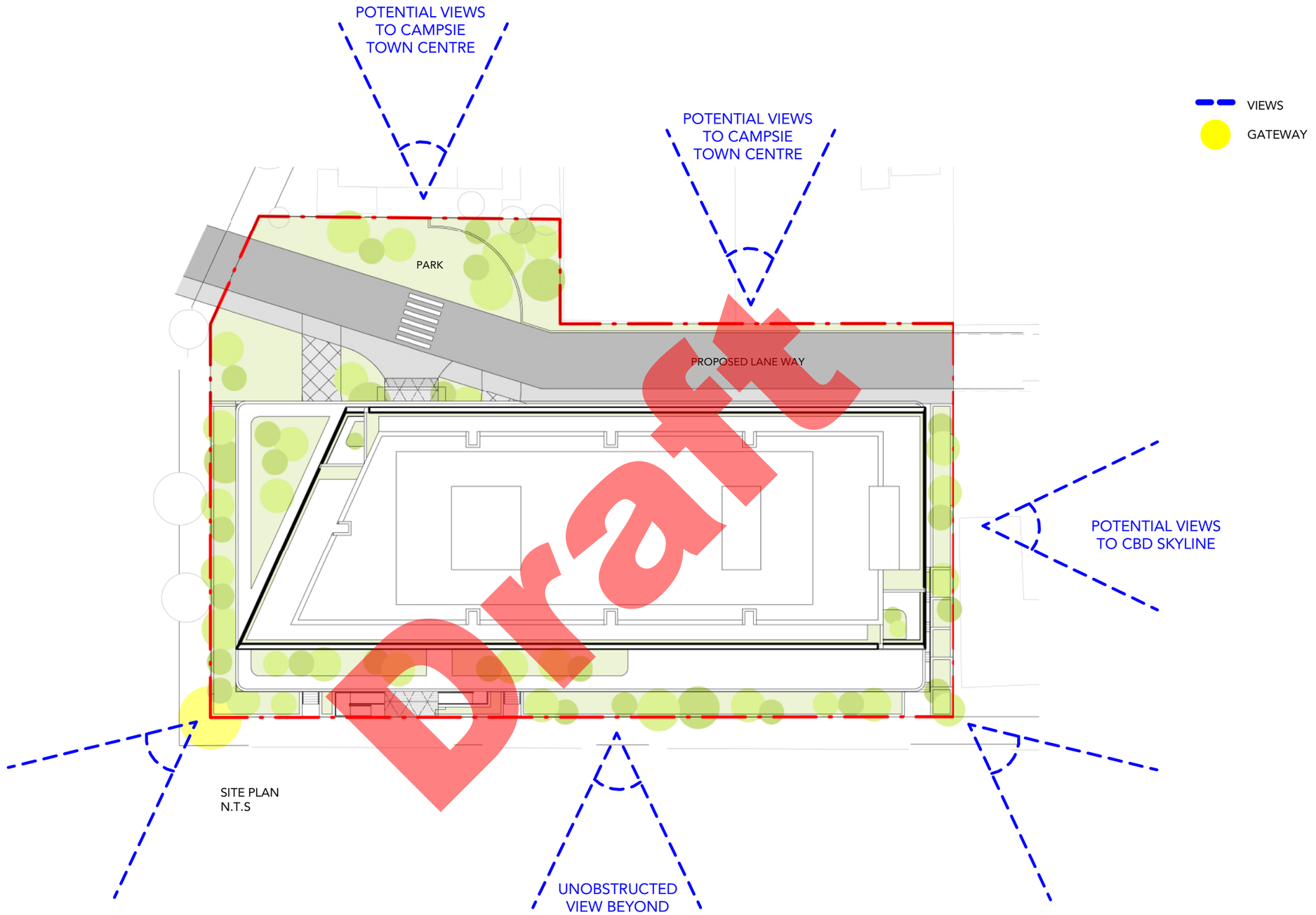
UPPER GROUND FLOOR PLAN
N.T.S

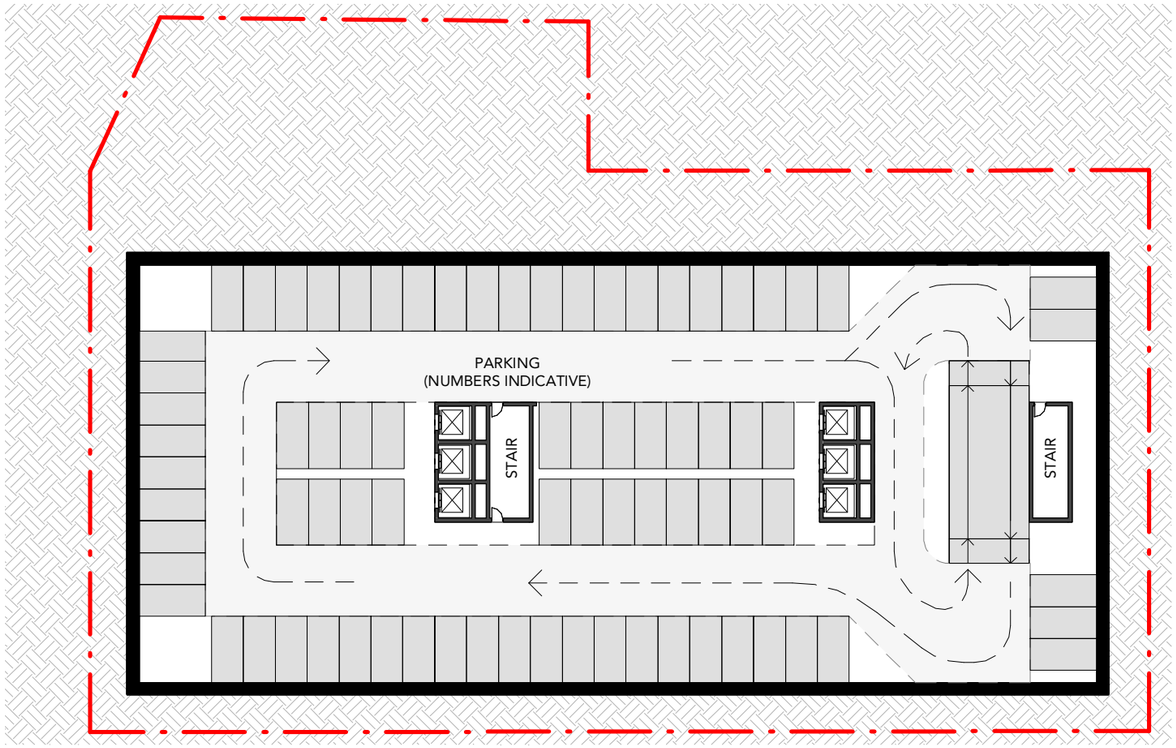


SITE PLAN
N.T.S

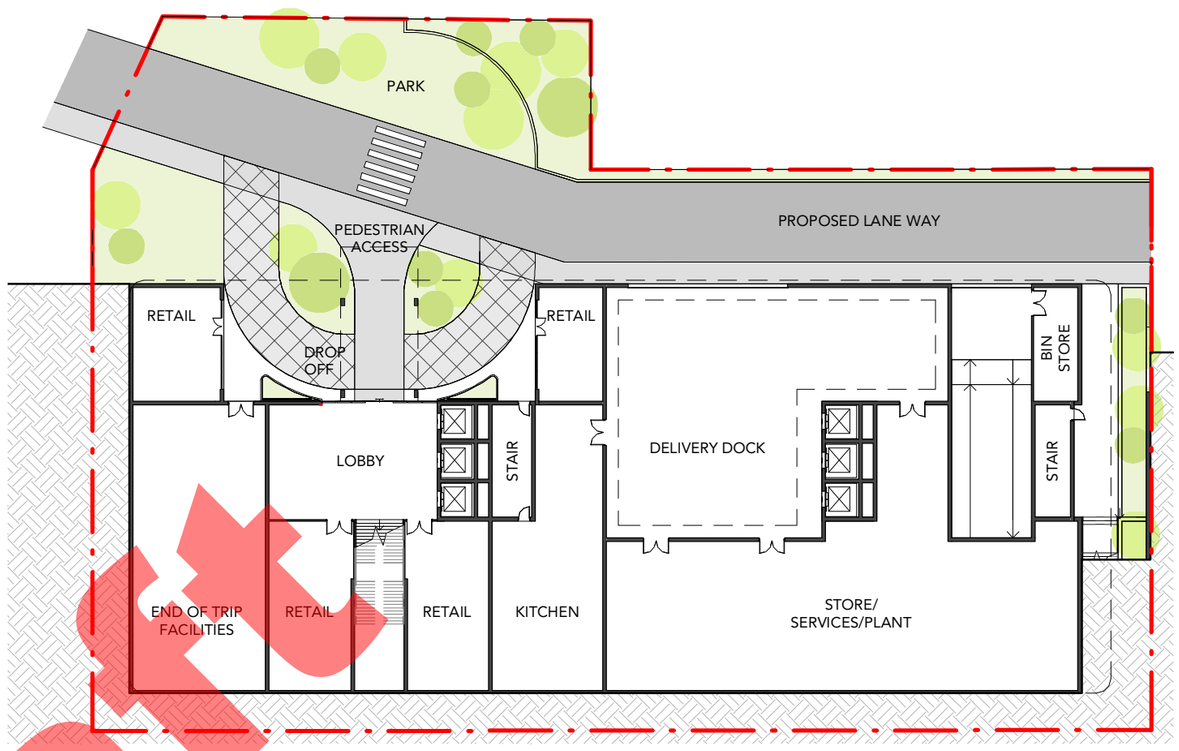




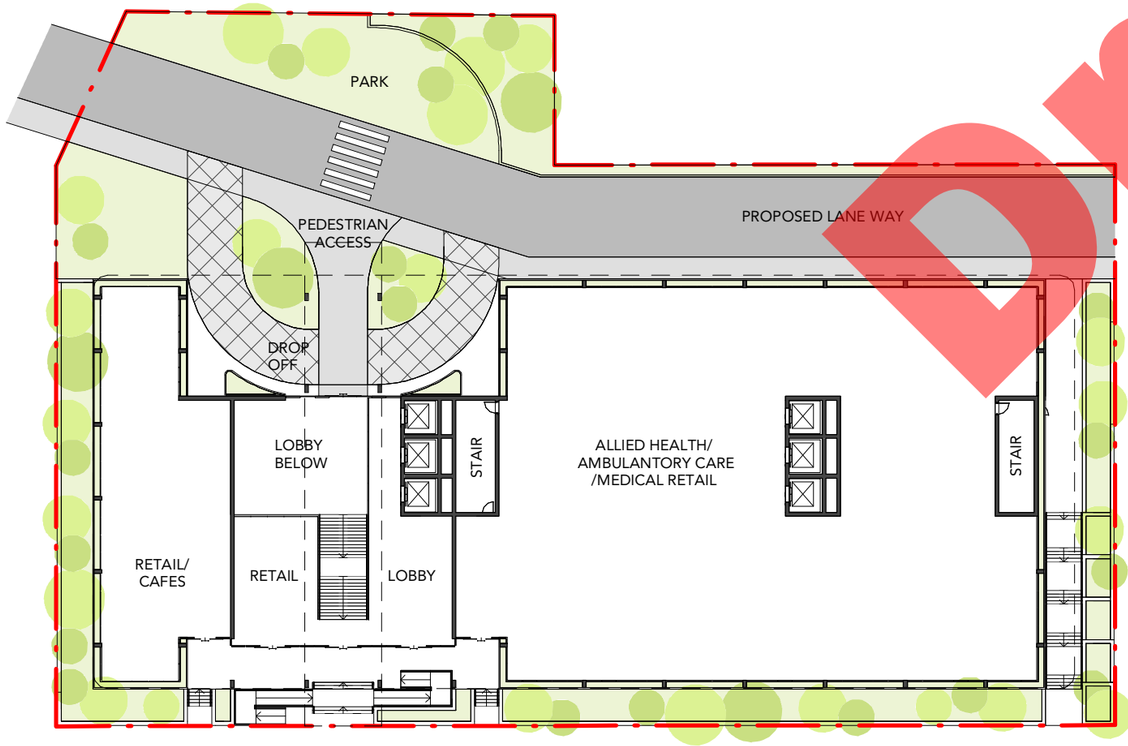

POTENTIAL VIEWS
TO CAMPSIE
TOWN CENTRE
POTENTIAL VIEWS
TO CAMPSIE
TOWN CENTRE
VIEWS
GATEWAY
PARK
PROPOSED LANE WAY
POTENTIAL VIEWS
TO CBD SKYLINE
SITE PLAN
N.T.S
UNOBSTRUCTED
VIEW BEYOND



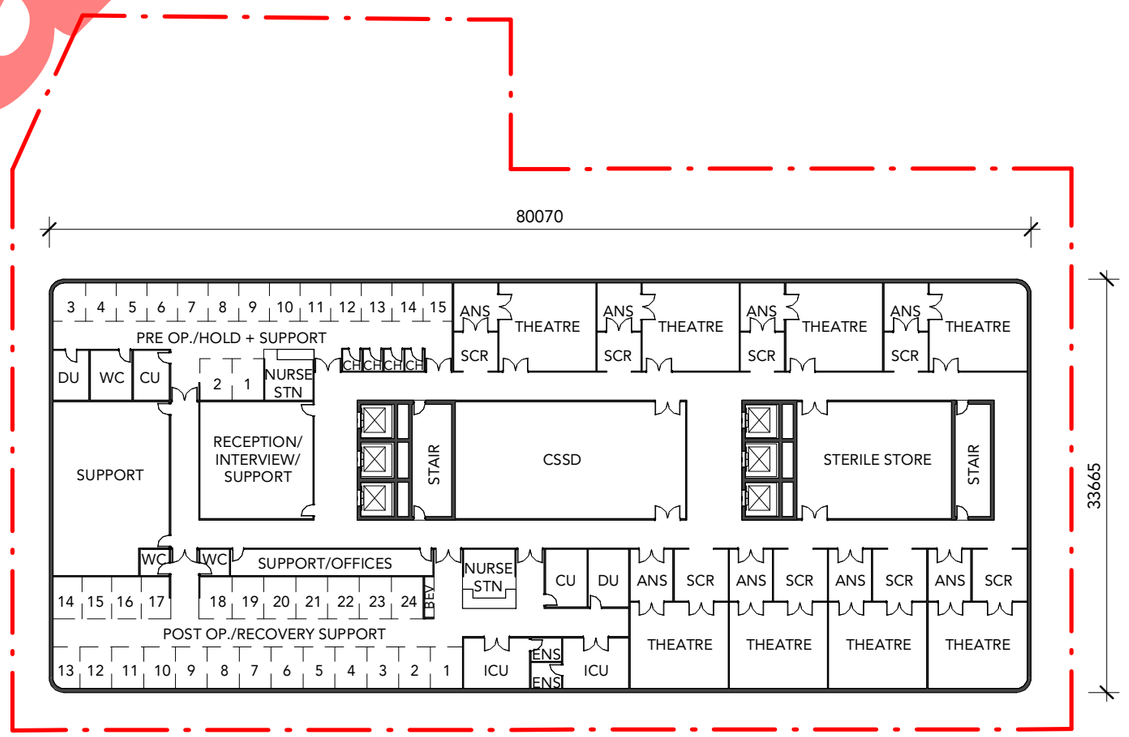
BASEMENT 1 - TYPICAL PARKING



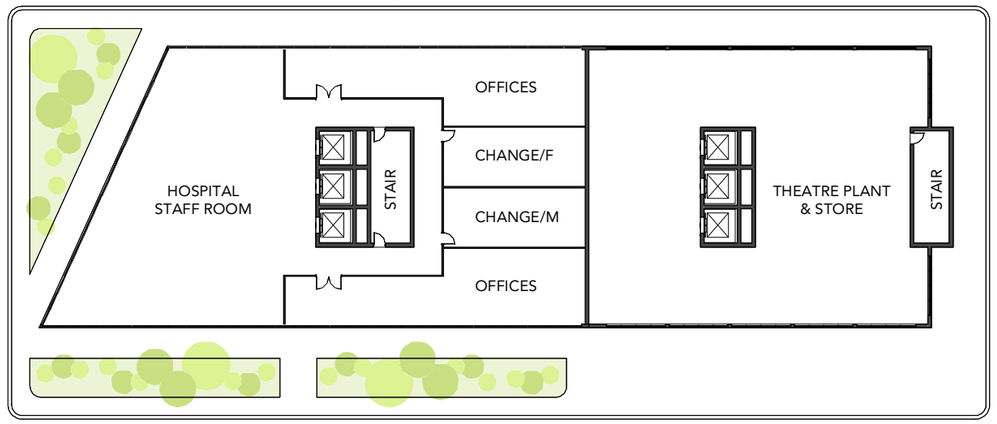
GROUND FLOOR LOWER - STANLEY ST ENTRY



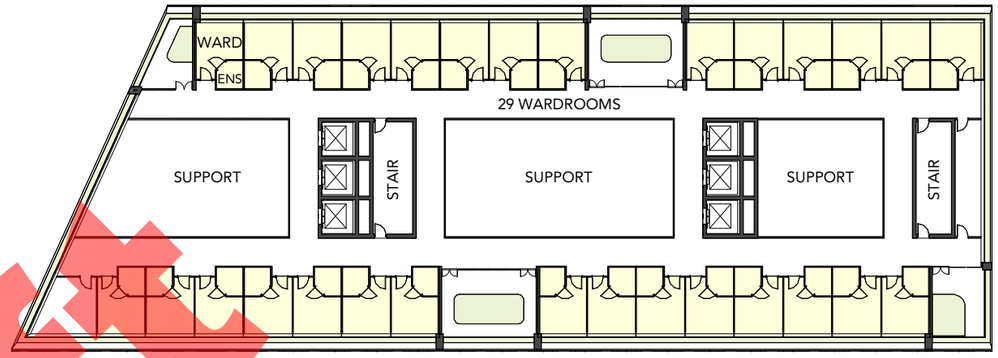
GROUND FLOOR UPPER - CANTERBURY ROAD ENTRY



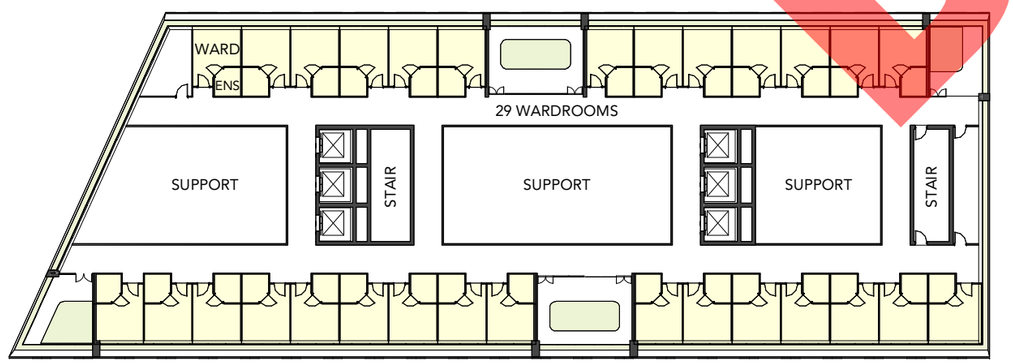
LEVEL 1 - THEATRE LEVEL



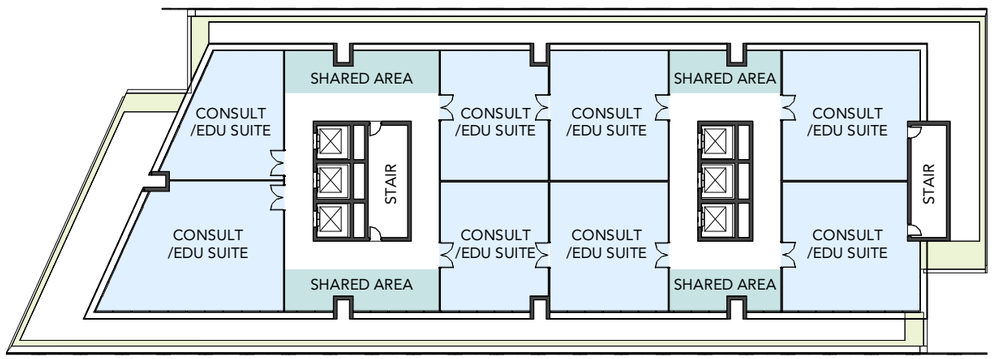
LEVEL 2 - STAFF OFFICES AND PLANT



LEVEL 3 - TYPICAL WARD LEVEL TYPE 1

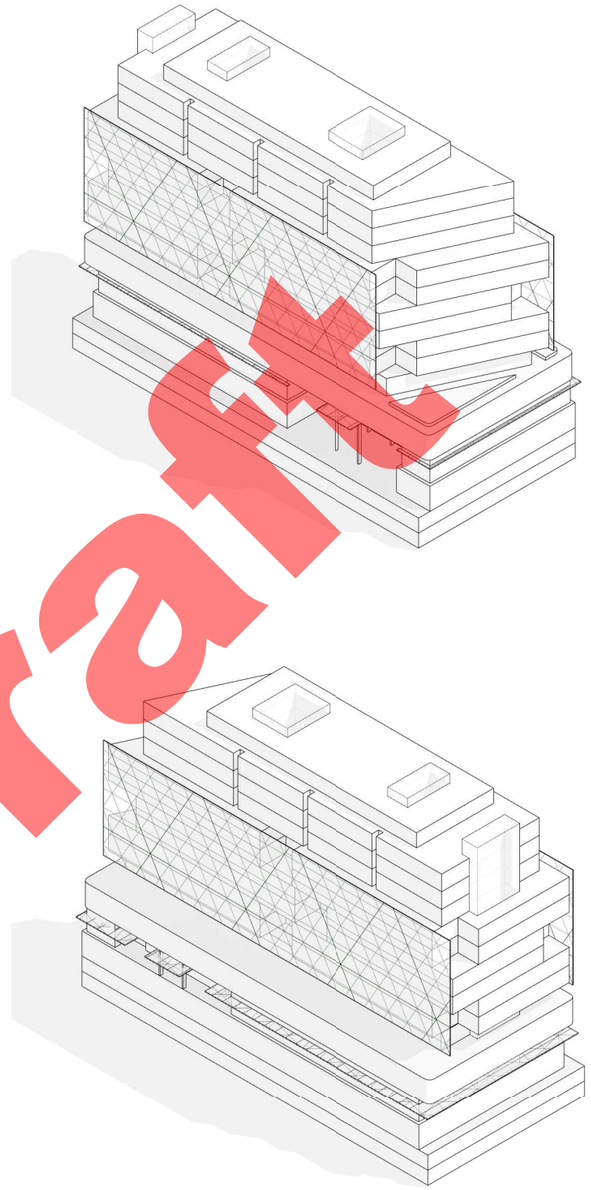


LEVEL 5 - TYPICAL WARD LEVEL TYPE 2



LEVEL 9 - TYPICAL CONSULT LEVEL

1 SECTION
Scale: 1 : 500



DEPARTMENTS:

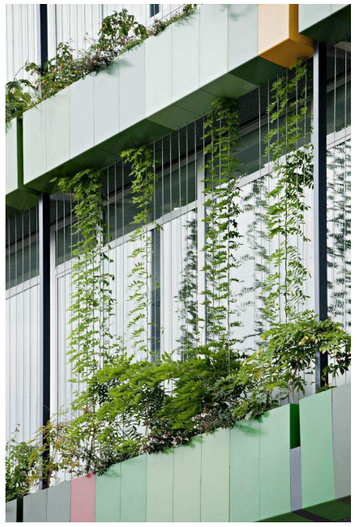
Site: 4414m²

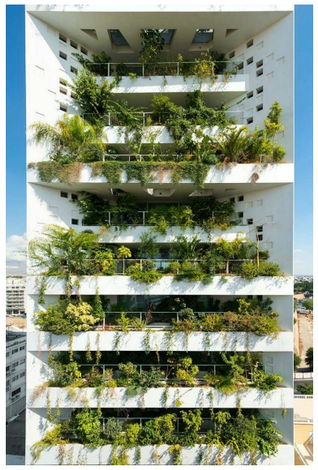
Basement 1	– *Parking*
Basement 2	– *Parking*
Ground lower	– *Loading Dock, Store & Retail*
Ground upper	– *Allied Health, Amb. Care & Medical Retail*
Level 1	– *Theatres & Recovery, CSSD, Sterile Stock*
Level 2	– *Theatre Lounge & Plant*
Level 3	– *In-patient Unit*
Level 4	– *In-patient Unit*
Level 5	– *In-patient Unit*
Level 6	– *In-patient Unit*
Level 7	– *In-patient Unit*
Level 8	– *In-patient Unit*
Level 9	– *Consult or Education Suites*
Level 10	– *Consult or Education Suites*
Level 11	– *Consult or Education Suites*
Plant	

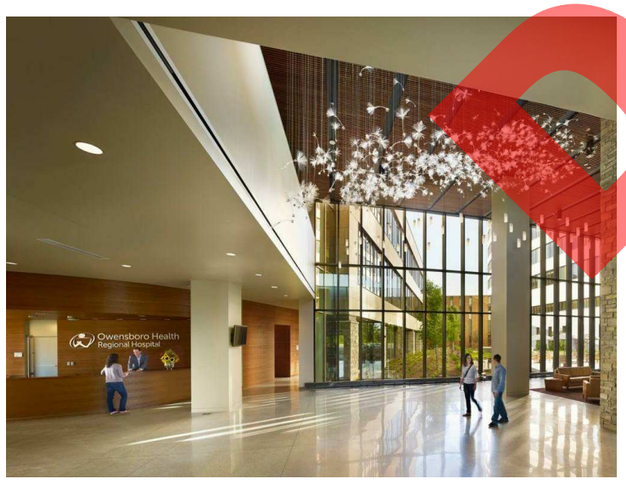

STREET ACTIVATION


LIGHT AND VIEWS THROUGHOUT

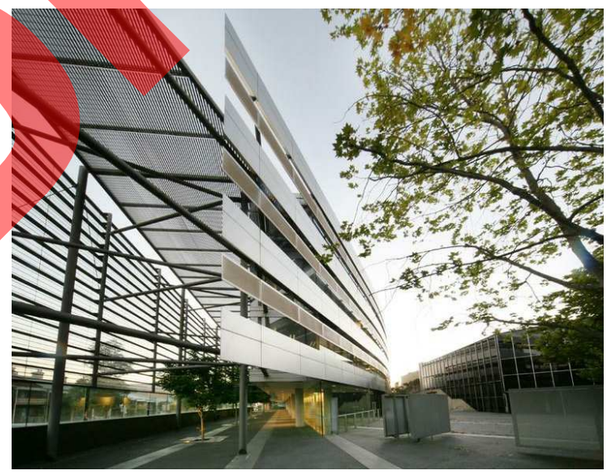

PUBLIC AMENITIES


LIVING SCREENS


SKY GARDENS



DOUBLE HEIGHT PUBLIC ENTRY ATRIUM


SOLAR AND ACOUSTIC SCREENING


PATIENT AND STAFF AMENITY

Perspective

445-459 Canterbury Road, Campsie

Forecast social and economic profile

- The PSA population is forecast to grow from 634,010 in 2016 to **932,940 in 2041**, representing an average annual growth rate of 1.6% or 47.1% over the entire period.
- The PSA **will continue to be an attractive place for families to reside**, where couples with dependents will grow by an average annual of 2.3%.
- Persons aged 65-84 will increase on average by 2,500 residents per year
- Cohorts aged 85 years and over **will more than double** from 12,460 in 2016 to 26,070 in 2036.
- Dwellings in the PSA are anticipated to grow from 226,574 in 2016 to 348,043 in 2041, representing **an annual average change of 4,860 additional dwellings**

Supply Analysis

- There are an estimated 823 (public and private) hospital beds within the PSA.
- This represents an estimated rate of 1.3 beds per 1,000 population
- Australia has an average of 3.9 beds per 1,000 population (*The Australian Institute of Health and Welfare 2017-18)*
- **The Primary Study Area has a significant undersupply of hospital beds given the supply provision is approximately 66% lower than the national average.**
- In 2016, the PSA had a gap in hospital beds provision of approximately 1,650 beds (based on national bed/population ratios).
- **By 2036, an estimated 2,360 beds will be required within the Primary Study Area**

Market Summary

- **Below average bed numbers (public and private hospitals) o**f 1.3 beds per 1,000 population, 66.0% lower than the National average at 3.9 beds per 1,000 persons.
- The proposed Campsie Private Hospital will assist in alleviating supply constraints on surrounding services, as well as reduce wait times through the provision of **up to 218 additional beds**, along with allied health services.
- **Demand for hospital services will increase substantially over time with an estimated additional 36,470 hospital admissions within the Primary Study Area** between 2016 and 2036, which is subject to fast population growth particularly in persons aged over 65 years and children aged 15 and below.
- There is an **opportunity for new and expanded services (Allied Health)** ancillary to the proposed hospital and existing Canterbury Public Hospital. This will support the strategic direction of developing the Eastern Medical and Lifestyle Precinct in Campsie.

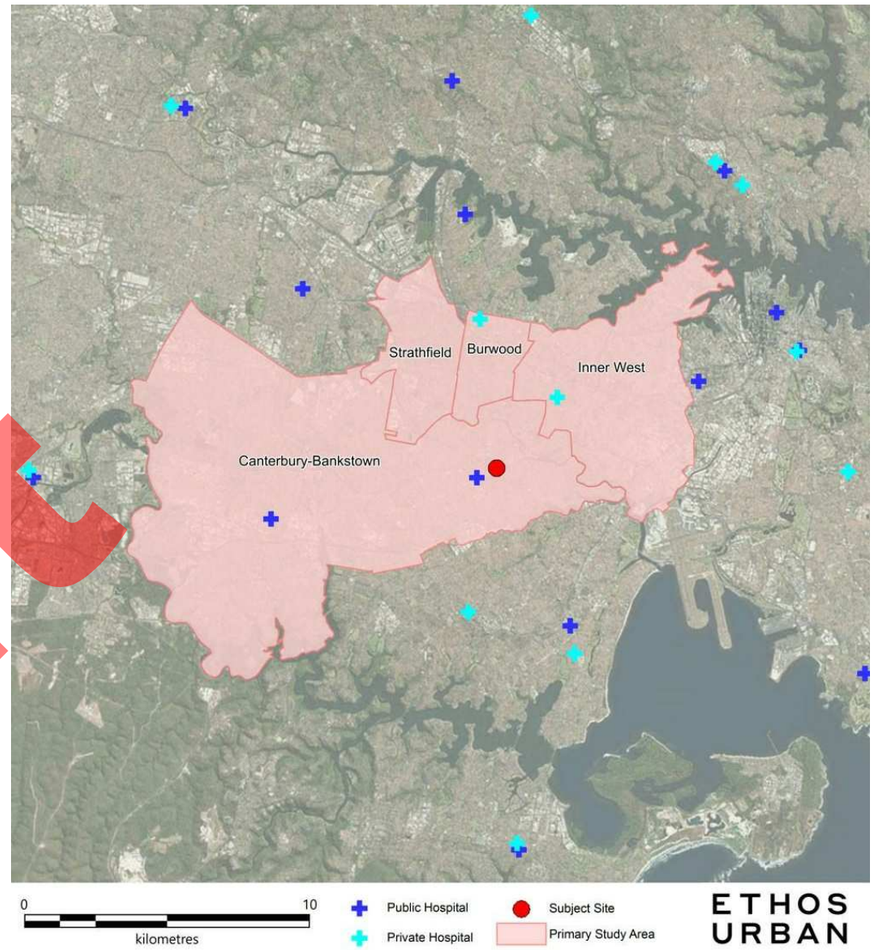
Employment

Construction

- The ABS construction multiplier is 2.6 - that is, for every single FTE job in the construction industry a further 1.6 FTE jobs are supported elsewhere in the economy through industrial and consumption effects.
- Construction will support an estimated **245 jobs *in the construction industry* and support a further 392 jobs *in related (supplier) industries* over the development period.**
- **In total, approximately 637 FTE construction jobs are likely to be supported during the construction phase.**

Ongoing

- The proposed Private Hospital will be an estimated 218 bed facility, which **will support the ongoing employment of approximately 1,090 workers** (full time, part time and casual) at a full bed occupancy**.**
- Applying a ratio of 0.73 (economy.id) – then approximately **765 FTE jobs** will be support by the private hospital.



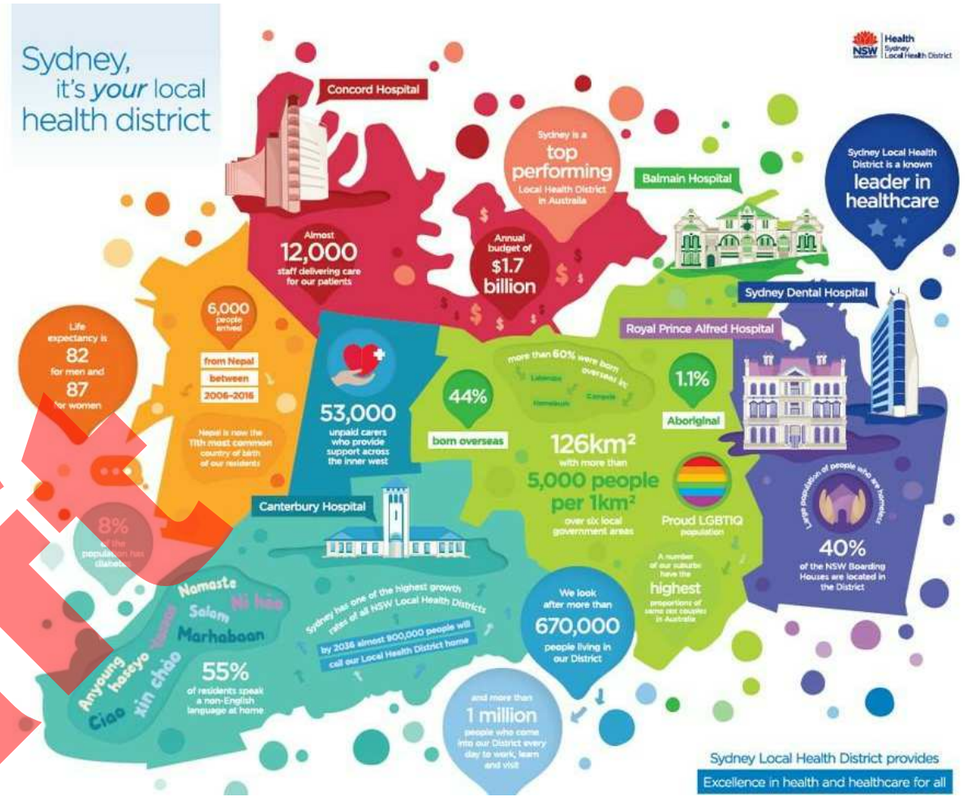
Within the Primary Study Area, there are four hospitals: two public and two private hospitals.

Strategic Policy Context – Key implications for community needs

- Population growth is placing pressure on existing infrastructure, which will need to be more flexible and adaptable to support community needs.
- **Health care in NSW needs to continue to meet patient expectations, deliver services to an ageing population, and provide response to disease burdens as a result of acute care, chronic and complex conditions**.
- Canterbury Bankstown LGA is a diverse community, with residents from a broad range of communities. It is a Council priority to develop thriving communities were people are safe, have strong connections, care for each other and are inclusive.
- It is a Council priority to optimise the existing health support services, facilities and retail along Canterbury Road and **support Canterbury Hospital to create a cohesive medical precinct in Campsie**
- At a local level, Sydney Local Health District (SLHD) has identified the need to redevelop Canterbury Hospital, and other health infrastructure in the district, to address the significant population growth, increasing demand and issues related to ageing infrastructure.
- To meet community needs**, NSW Health is exploring opportunities to develop partnerships across the health and social care sector** that will integrate care, build capacity and deliver on key strategic goals, with a focus on areas with a high degree of population growth and health needs (such as Canterbury).

Strategic Need- Sydney Local Health District

- A focus of health provision for the District **is to provide care for an ageing demographic, that is socially and culturally diverse.**
- SLHD has identified the need to redevelop Canterbury Hospital, and other health infrastructure in the district, **to address the significant population growth, increasing demand and issues related to ageing infrastructure**
- Private Hospitals form an integral part of the NSW health system, **providing for additional choices in health services.**
- Elective surgeries, cardiac procedures, rehabilitation and psychiatric services are commonly performed within a private hospital setting.
- **Private hospitals are more likely to treat people aged 65years and over,** and as a result may have increasing demands in supporting health care provision in NSW as the general population ages



Strategic Need- Campsie

- There is an inadequate provision of health care services in the Canterbury Bankstown region, particularly in relation to the provision of hospital beds.
- There are **no private hospitals in the Canterbury to Bankstown or LGA.**
- The Site provides an opportunity for additional medical facilities for the South District of Sydney.
- The Site will form part of the strategic centre for Campsie, aligning health needs of the broader community through **facilitation of private and public health care within Campsie Strategic Centre.**
- The development of a Private Hospital on the site will provide **additional medical services** (including inpatient and outpatient care), elective procedures and attract top quality medical specialists to the area.
- Population growth predicted for the region is expected to lead to a demand for **increased access to elective private medical services**, that will be supported by a new facility at the site

Benefits of medical colocation and innovation hubs

- Sharing of facilities such as equipment and staff
- Greater convenience for doctors working in both private and public services/specialists
- Enhances patient choice by facilitating access to a wider range of services
- Offers medical specialists a back up service in the public hospital where complications occur during treatment.
- Retains and attracts medical specialists by enhancing their patient offerings
- Increases viability of teaching services, which can leader to further health investment in public hospitals
- Encourages further clustering of complementary usages and support usages and services, promoting the precinct's viability.

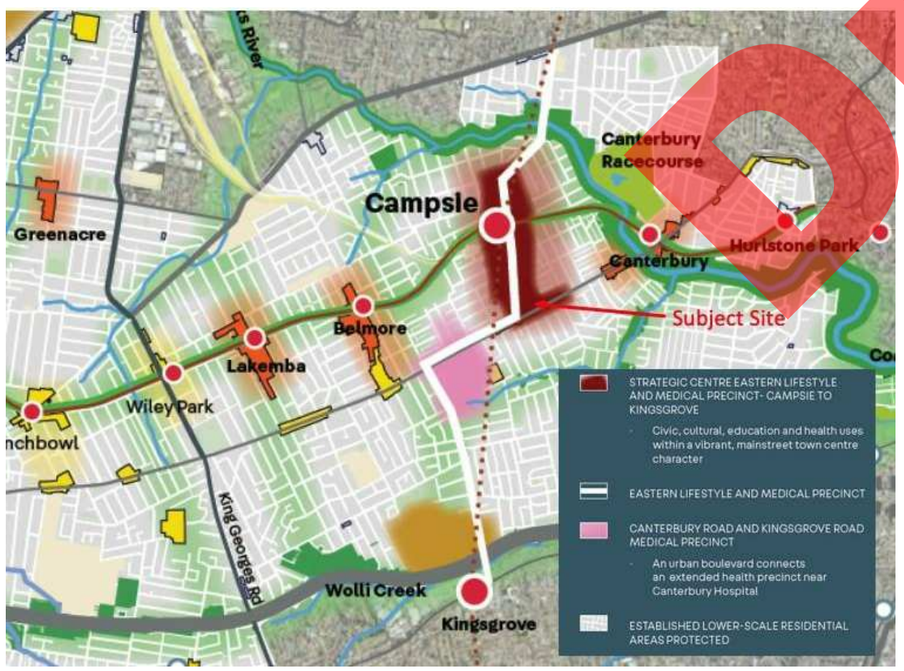
Alignment with Strategic Planning Priorities

- **NSW Planning fast-track in response to COVID19**: As a new private hospital, the proposal fundamentally aligns with the NSW Government's response to COVID19 and is well placed to be take up the fast track process to potentially have the PP and SSD assessed concurrently.

- **CB City LSPS 2019:** The site is located within the Campsie Strategic Centre and the broader Eastern Lifestyle and Medical Precinct – Campsie to Kingsgrove (Refer to *Figure* below). Where the Precinct's evolution is to capitalize on the hospital and expand medical support uses. The plan also outlines that areas between Canterbury Road, Kingsgrove Road and Beamish Street will be an urban boulevard and medical destination. The LSPS aims to build an extended medical precinct in this area, leveraging Canterbury Hospital and supporting medical services and encouraging the agglomeration of medical facilities and industries within the precinct. The site would provide a new private hospital in a key location in the Eastern Lifestyle and Medical Precinct, supporting the growth of the medical precinct and provide an important link between Canterbury Hospital and Campsie Town Centre, which fundamentally aligns with the subject project.

- **South District Plan 2018:** Campsie is identified as a Strategic Centre within the Greater Sydney Commission's *South District Plan*, with a total 4,800 jobs in 2016 anticipated to increase to at least 7,000 by 2036. The site provides an important opportunity to provide new and diverse medical facilities in Campsie, supporting the delivery of high knowledge jobs in Canterbury Bankstown and the urban renewal of Canterbury Road. This aligns with the goals of the South District Plan by providing an important link between Campsie Town Centre and Canterbury Hospital, supporting jobs growth in Campsie Strategic Centre.

- **Sydenham to Bankstown Urban Renewal Strategy:** In November 2019. The Department of Planning Industry and Environment announced a new approach to precinct planning to provide certainty for precincts and putting greater responsibility for planning in the hands of councils and local communities. The Sydenham to Bankstown Corridor, which includes Campsie, was designated as a State-led strategic planning precinct where early investigations and high-level strategic planning work would be led by the Department, in collaboration with Councils and state agencies, to inform future rezoning processes. This project closely aligns with that approach to strategic planning in the local area.



APPENDIX

C

HISTORICAL ANALYSIS RESULTS

				TPH		BTEX				Metals										PAHs			Phenols		Halogenated Phenols		Pesticides				PCBs
				Preliminary Material Classification	C6 - C9	+C10 - C36 (Sum of total)	Benzene	Toluene	Ethylbenzene	Xylene Total	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead		Mercury	Nickel		Zinc	Benzo(a)pyrene	PAHs (Sum of total)	2-methylphenol	Phenol	2,4,5-trichlorophenol	2,4,6-trichlorophenol	Endosulfan	Endosulfan I	Endosulfan II	Endosulfan sulphate	PCBs (Sum of total)
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL					20	50	0.1	0.1	0.1	0.3	2	0.4	5	5	5	0.01	0.1	5	0.01	5	0.5	0.001	0.5	0.2	0.5	1	1	0.05	0.05	0.05	0.05	0.5
NSW 2014 Excavated Natural Material (Absolute Max)						500	0.5	65	25	15	40	1	150	200	100		1	60		300	1		40								
NSW 2014 General Solid Waste CT1 (No Leaching)					650	10000	10	288	600	1000	100	20	100		100		4	40			0.8		200	4000		8000	40	60	60	60	60	<50
NSW 2014 General Solid Waste SCC1 (with leached)											500				1500	5		1050	2		10	0.05									
NSW 2014 Restricted Solid Waste CT2 (No Leaching)					2600	40000	40	1152	2400	4000	400	80	400		400		16	160			3.2			16000		32000	160	240	240	240	240	<50
NSW 2014 Restricted Solid Waste SCC1 (with leached)															6000	20		4200	8		23	0.16									
Sample ID	**Location ID**	**Sample Depth**	**Sample Date**																												
BH1_1.0-1.5	BH01	1-1.5	18/01/2017	ENM	<20	<50	<0.1	<0.1	<0.1	<0.3	19	<0.4	16	88	32	-	<0.1	6.6	-	72	<0.5	-	<0.5	<0.2	<0.5	<1	<1	-	<0.05	<0.05	<0.05	<0.5
BH1_2.4	BH01	2.4	18/01/2017	ENM	<20	<50	<0.1	<0.1	<0.1	<0.3	8.9	<0.4	9.5	11	15	-	<0.1	<5	-	<5	<0.5	-	<0.5	<0.2	<0.5	<1	<1	-	<0.05	<0.05	<0.05	<0.5
BH2_0.5	BH02	0.5	18/01/2017	RSW	<20	<50	<0.1	<0.1	<0.1	<0.3	350	<0.4	8.9	45	63	-	0.7	8.6	-	240	<0.5	-	<0.5	<0.2	<0.5	<1	<1	-	<0.05	<0.05	<0.05	<0.5
BH2_2.4	BH02	2.4	18/01/2017	ENM	<20	<50	<0.1	<0.1	<0.1	<0.3	13	<0.4	46	7	27	-	<0.1	<5	-	6.7	<0.5	-	<0.5	<0.2	<0.5	<1	<1	-	<0.05	<0.05	<0.05	<0.5
BH3_1.8	BH03	1.8	18/01/2017	GSW	<20	2200	<0.1	<0.1	<0.1	<0.3	9.4	<0.4	30	9.2	31	-	<0.1	5.6	-	6.4	<0.5	-	0.8	<0.2	<0.5	<1	<1	-	<0.05	<0.05	<0.05	<0.5
BH3_3.0	BH03	3	18/01/2017	GSW	<20	120	<0.1	<0.1	<0.1	<0.3	15	<0.4	53	6.2	29	-	<0.1	<5	-	9.3	<0.5	-	<0.5	<0.2	<0.5	<1	<1	-	<0.05	<0.05	<0.05	<0.5
BH4_1.5	BH04	1.5	18/01/2017	RSW	<20	3129	<0.1	<0.1	<0.1	<0.3	32	<0.4	24	33	220	-	<0.1	<5	-	120	<0.5	-	<0.5	<0.2	<0.5	<1	<1	-	<0.05	<0.05	<0.05	<0.5
BH4_2.5	BH04	2.5	18/01/2017	RSW	20	15,290	<0.1	<0.1	<0.1	<0.3	6.2	<0.4	21	21	170	-	<0.1	6.1	-	270	<0.5	-	5.7	<0.2	<0.5	<1	<1	-	<0.05	<0.05	<0.05	<0.5
BH5_0.2	BH05	0.2	18/01/2017	GSW	<20	500	<0.1	<0.1	<0.1	<0.3	6.4	<0.4	6.7	37	24	-	<0.1	12	-	70	<0.5	-	<0.5	<0.2	<0.5	<1	<1	-	<0.05	<0.05	<0.05	<0.5
BH6_1.2	BH06	1.2	17/01/2017	RSW	<20	96	<0.1	<0.1	<0.1	<0.3	14	0.7	33	26	240	-	<0.1	9.1	-	500	2.5	-	25.9	<0.2	<0.5	<1	<1	-	<0.05	<0.05	<0.05	<0.5
BH6_1.8	BH06	1.8	17/01/2017	ENM	<20	<50	<0.1	<0.1	<0.1	<0.3	9.6	<0.4	26	<5	20	-	<0.1	<5	-	<5	<0.5	-	<0.5	<0.2	<0.5	<1	<1	-	<0.05	<0.05	<0.05	<0.5
BH7_0.2	BH07	0.2	18/01/2017	RSW	<20	100	<0.1	<0.1	<0.1	<0.3	8.2	<0.4	23	11	160	-	<0.1	<5	-	130	<0.5	-	<0.5	<0.2	<0.5	<1	<1	-	<0.05	<0.05	<0.05	<0.5
BH8_0.5	BH08	0.5	17/01/2017	Haz	<20	200	<0.1	<0.1	<0.1	<0.3	6.4	<0.4	16	13	180	-	<0.1	<5	-	76	4.3	-	61.8	<0.2	<0.5	<1	<1	-	<0.05	<0.05	<0.05	<0.5
BH9_1.0	BH09	1	17/01/2017	ENM	<20	56	<0.1	<0.1	<0.1	<0.3	11	<0.4	26	5.4	25	-	<0.1	<5	-	5.8	<0.5	-	<0.5	<0.2	<0.5	<1	<1	-	<0.05	<0.05	<0.05	<0.5
BH10_1.8	BH10	1.8	17/01/2017	ENM	<20	<50	<0.1	<0.1	<0.1	<0.3	<2	<0.4	5.9	6.2	15	-	<0.1	<5	-	<5	<0.5	-	<0.5	<0.2	<0.5	<1	<1	-	<0.05	<0.05	<0.05	<0.5
BH11_3.2	BH11	3.2	30/09/2020	ENM	<20	<50	<0.1	<0.1	<0.1	<0.3	<2	<0.4	12	16	16	-	<0.1	<5	-	16	<0.5	-	<0.5	-	-	-	-	-	-	-	-	-
BH11_4.5	BH11	4.5	30/09/2020	GSW	<20	560	<0.1	<0.1	<0.1	<0.3	9.2	<0.4	17	29	35	-	<0.1	<5	-	61	<0.5	-	<0.5	-	-	-	-	-	-	-	-	-
BH11_5.0	BH11	5	30/09/2020	-	<20	<50	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW1_0.8	MW01	0.8	18/01/2017	RSW	<20	1960	<0.1	<0.1	<0.1	<0.3	11	<0.4	17	33	110	-	0.2	6.4	-	150	0.7	-	6.8	<0.2	<0.5	<1	<1	-	<0.05	<0.05	<0.05	<0.5
MW1_4.0	MW01	4	18/01/2017	ENM	<20	430	<0.1	<0.1	<0.1	<0.3	13	<0.4	11	33	25	-	<0.1	<5	-	20	<0.5	-	<0.5	<0.2	<0.5	<1	<1	-	<0.05	<0.05	<0.05	<0.5
MW2_1.0	MW02	1	17/01/2017	RSW	<20	77	<0.1	<0.1	<0.1	<0.3	5.3	<0.4	13	48	300	-	0.9	5.1	-	500	0.6	-	6.4	<0.2	<0.5	<1	<1	-	<0.05	<0.05	<0.05	<0.5
MW2_4.5	MW02	4.5	17/01/2017	Haz	<20	<50	<0.1	<0.1	<0.1	<0.3	11	<0.4	7.4	19	430	-	0.1	5.2	-	350	<0.5	-	<0.5	<0.2	<0.5	<1	<1	-	<0.05	<0.05	<0.05	<0.5
MW3_0.8	MW03	0.8	18/01/2017	ENM	<20	89	<0.1	<0.1	<0.1	<0.3	8.9	<0.4	6.9	22	71	-	<0.1	16	-	55	<0.5	-	<0.5	<0.2	<0.5	<1	<1	-	<0.05	<0.05	<0.05	<0.5
QA1	MW03	0.8	17/01/2017	ENM	<20	66	<0.1	<0.1	<0.1	<0.3	10	<0.4	7.6	28	87	-	<0.1	15	-	68	<0.5	-	<0.5	<0.2	<0.5	<1	<1	-	<0.05	<0.05	<0.05	<0.5
QA2	MW03	0.8	18/01/2017	ENM	<10	<50	<0.2	<0.5	<0.5	<0.5	8	<1	6	22	61	-	<0.1	12	-	60	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05	<0.05	<0.1
MW04_0.5	MW04	0.5	30/09/2020	GSW	<20	142	<0.1	<0.1	<0.1	<0.3	8.1	<0.4	32	20	56	-	<0.1	11	-	61	1.1	<0.001	11.1	-	-	-	-	-	-	-	-	-
MW04_1.2	MW04	1.2	30/09/2020	ENM	<20	<50	<0.1	<0.1	<0.1	<0.3	14	<0.4	54	10	34	-	<0.1	8.4	-	8.5	<0.5	-	<0.5	-	-	-	-	-	-	-	-	-
MW05_0.2	MW05	0.2	30/09/2020	GSW	<20	71	<0.1	<0.1	<0.1	<0.3	3.6	<0.4	33	650	96	-	0.1	93	0.12	390	<0.5	-	<0.5	-	-	-	-	-	-	-	-	-
QA100	MW05	0.2	30/09/2020	GSW	<20	205	<0.1	<0.1	<0.1	<0.3	5.2	<0.4	34	1300	310	0.03	0.3	97	0.1	560	<0.5	-	<0.5	-	-	-	-	-	-	-	-	-
MW05_3.0	MW05	3	30/09/2020	ENM	<20	<50	<0.1	<0.1	<0.1	<0.3	15	<0.4	46	22	38	-	<0.1	5	-	19	<0.5	-	<0.5	-	-	-	-	-	-	-	-	-
MW06_1.2	MW06	1.2	30/09/2020	GSW	<20	2825	<0.1	<0.1	<0.1	<0.3	20	<0.4	19	130	300	0.33	0.5	25	-	230	<0.5	-	0.6	-	-	-	-	-	-	-	-	-

	CRC Care TPH Fractions							BTEX							Metals								Inorganics		Asbestos
	C6-C10	C10-C16	C16-C34	C34-C40	C10 - C40 (Sum of total)	F1: C6-C10 less BTEX	F2: >C10-C16 less NAPHTHALENE	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Total BTEX	Xylene Total	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	Moisture	Moisture Content (dried @ 103°C)	Asbestos
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	Comment
EQL	20	50	100	100	100	20	50	0.1	0.1	0.1	0.2	0.1	0.2	0.3	2	0.4	5	5	5	0.1	5	5	1	1	
CRCCARE 2011 Soil HSL for Direct Contact, HSL-D Com/Ind																									
0-1m	26000	20000	27000	38000				430	99000	27000				81000											
NEPM 2013 HIL, Residential B															500	150		30000	1200	120	1200	60000			
NEPM 2013 Soil HSL Commercial/Industrial D, for Vapour Intrusion, Sand																									
0-1m						260	NL	3	NL	NL				230											
1-2m						370	NL	3	NL	NL				NL											
2-4m						630	NL	3	NL	NL				NL											
>4m						NL	NL	3	NL	NL				NL											
Sample ID	**Location ID**	**Sample Depth**	**Sample Date**																							
BH1_1.0-1.5	BH01	1-1.5	18/01/2017	<20	<50	<100	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	19	<0.4	16	88	32	<0.1	6.6	72	-	23	Nil
BH1_2.4	BH01	2.4	18/01/2017	<20	<50	<100	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	8.9	<0.4	9.5	11	15	<0.1	<5	<5	-	19	Nil
BH2_0.5	BH02	0.5	18/01/2017	<20	<50	<100	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	350	<0.4	8.9	45	63	0.7	8.6	240	-	14	Nil
BH2_2.4	BH02	2.4	18/01/2017	<20	<50	<100	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	13	<0.4	46	7	27	<0.1	<5	6.7	-	17	Nil
BH3_1.8	BH03	1.8	18/01/2017	<20	<50	1900	680	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	9.4	<0.4	30	9.2	31	<0.1	5.6	6.4	-	33	Nil
BH3_3.0	BH03	3	18/01/2017	<20	<50	<100	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	15	<0.4	53	6.2	29	<0.1	<5	9.3	-	29	Nil
BH4_1.5	BH04	1.5	18/01/2017	<20	<50	2600	900	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	32	<0.4	24	33	220	<0.1	<5	120	-	22	Nil
BH4_2.5	BH04	2.5	18/01/2017	31	240	13,000	4700	-	31	240	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	6.2	<0.4	21	21	170	<0.1	6.1	270	-	34	Nil
BH5_0.2	BH05	0.2	18/01/2017	<20	<50	410	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	6.4	<0.4	6.7	37	24	<0.1	12	70	-	8.1	Nil
BH6_1.2	BH06	1.2	17/01/2017	<20	<50	120	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	14	0.7	33	26	240	<0.1	9.1	500	-	23	Nil
BH6_1.8	BH06	1.8	17/01/2017	<20	<50	<100	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	9.6	<0.4	26	<5	20	<0.1	<5	<5	-	24	Nil
BH7_0.2	BH07	0.2	18/01/2017	<20	<50	110	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	8.2	<0.4	23	11	160	<0.1	<5	130	-	20	Nil
BH8_0.5	BH08	0.5	17/01/2017	<20	<50	190	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	6.4	<0.4	16	13	180	<0.1	<5	76	-	18	Nil
BH9_1.0	BH09	1	17/01/2017	<20	<50	<100	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	11	<0.4	26	5.4	25	<0.1	<5	5.8	-	24	Nil
BH10_1.8	BH10	1.8	17/01/2017	<20	<50	<100	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<2	<0.4	5.9	6.2	15	<0.1	<5	<5	-	20	Nil
BH11_3.2	BH11	3.2	30/09/2020	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<2	<0.4	12	16	16	<0.1	<5	16	-	19	-
BH11_4.5	BH11	4.5	30/09/2020	<20	<50	450	270	720	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	9.2	<0.4	17	29	35	<0.1	<5	61	-	17	-
BH11_5.0	BH11	5	30/09/2020	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	-	-	-	-	-	-	-	-	-	20	-
MW1_0.8	MW01	0.8	18/01/2017	<20	<50	1700	600	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	11	<0.4	17	33	110	0.2	6.4	150	-	21	Nil
MW1_4.0	MW01	4	18/01/2017	<20	<50	350	110	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	13	<0.4	11	33	25	<0.1	<5	20	-	17	Nil
MW2_1.0	MW02	1	17/01/2017	<20	<50	<100	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	5.3	<0.4	13	48	300	0.9	5.1	500	-	17	Nil
MW2_4.5	MW02	4.5	17/01/2017	<20	<50	<100	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	11	<0.4	7.4	19	430	0.1	5.2	350	-	17	Nil
MW3_0.8	MW03	0.8	18/01/2017	<20	<50	<100	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	8.9	<0.4	6.9	22	71	<0.1	16	55	-	26	Nil
QA1	MW03	0.8	17/01/2017	<20	<50	<100	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	10	<0.4	7.6	28	87	<0.1	15	68	-	8.6	Nil
QA2	MW03	0.8	18/01/2017	<10	<50	<100	<100	<50	<10	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.2	<0.5	8	<1	6	22	61	<0.1	12	60	16.2	-	-
MW04_0.5	MW04	0.5	30/09/2020	<20	<50	110	<100	110	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	8.1	<0.4	32	20	56	<0.1	11	61	-	24	-
MW04_1.2	MW04	1.2	30/09/2020	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	14	<0.4	54	10	34	<0.1	8.4	8.5	-	28	-
MW05_0.2	MW05	0.2	30/09/2020	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	3.6	<0.4	33	650	96	0.1	93	390	-	7.6	-
QA100	MW05	0.2	30/09/2020	<20	<50	160	110	270	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	5.2	<0.4	34	1300	310	0.3	97	560	-	6.2	-
MW05_3.0	MW05	3	30/09/2020	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	15	<0.4	46	22	38	<0.1	5	19	-	24	-
MW06_1.2	MW06	1.2	30/09/2020	<20	<50	2400	960	3360	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	20	<0.4	19	130	300	0.5	25	230	-	18	-

				PAH																		Phenols					
				Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(k)fluoranthene	Benzo(b+j)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenzo(a,h)anthracene	Benzo(g,h,i)perylene	Benzo(a)pyrene TEQ (Zero LOR)	Benzo(a)pyrene TEQ (Half LOR)_0	Benzo(a)pyrene TEQ (Full LOR)	PAHs (Sum of total)	2,4-dimethylphenol	2-methylphenol	2-nitrophenol	3-&4-methylphenol	4-chloro-3-methylphenol	Phenol
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.2	1	0.4	1	0.5
CRCCARE 2011 Soil HSL for Direct Contact, HSL-D Com/Ind																													
0-1m				11000																									
NEPM 2013 HIL, Residential B																				4	4	4	400						45000
NEPM 2013 Soil HSL Commercial/Industrial D, for Vapour Intrusion, Sand																													
0-1m				NL																									
1-2m				NL																									
2-4m				NL																									
>4m				NL																									
Sample ID	**Location ID**	**Sample Depth**	**Sample Date**																										
BH1_1.0-1.5	BH01	1-1.5	18/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5
BH1_2.4	BH01	2.4	18/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5
BH2_0.5	BH02	0.5	18/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5
BH2_2.4	BH02	2.4	18/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5
BH3_1.8	BH03	1.8	18/01/2017	<0.5 - 0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	0.8	<0.5	<0.2	<1	<0.4	<1	<0.5
BH3_3.0	BH03	3	18/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5
BH4_1.5	BH04	1.5	18/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5
BH4_2.5	BH04	2.5	18/01/2017	<0.5 - 1.7	<0.5	<0.5	0.7	1.4	<0.5	0.7	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	5.7	<0.5	<0.2	<1	<0.4	<1	<0.5
BH5_0.2	BH05	0.2	18/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5
BH6_1.2	BH06	1.2	17/01/2017	<0.5	<0.5	<0.5	<0.5	1.2	<0.5	4	4.1	2.4	2.1	2.1	3.1	2.5	1.8	<0.5	2.6	3.5	3.7	4	25.9	<0.5	<0.2	<1	<0.4	<1	<0.5
BH6_1.8	BH06	1.8	17/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5
BH7_0.2	BH07	0.2	18/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5
BH8_0.5	BH08	0.5	17/01/2017	<0.5	1.2	<0.5	<0.5	8.1	2.1	12	10	4.9	4.1	3.7	4.9	4.3	2.7	0.8	3	6.8	6.8	6.8	61.8	<0.5	<0.2	<1	<0.4	<1	<0.5
BH9_1.0	BH09	1	17/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5
BH10_1.8	BH10	1.8	17/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5
BH11_3.2	BH11	3.2	30/09/2020	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	-	-	-	-	-
BH11_4.5	BH11	4.5	30/09/2020	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	-	-	-	-	-
BH11_5.0	BH11	5	30/09/2020	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW1_0.8	MW01	0.8	18/01/2017	<0.5	<0.5	<0.5	<0.5	0.9	<0.5	1.2	1.4	0.5	0.7	0.7	0.7	0.7	<0.5	<0.5	<0.5	0.9	1.2	1.5	6.8	<0.5	<0.2	<1	<0.4	<1	<0.5
MW1_4.0	MW01	4	18/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5
MW2_1.0	MW02	1	17/01/2017	<0.5	<0.5	<0.5	<0.5	0.8	<0.5	1.1	1.1	0.8	0.7	0.5	0.8	0.6	<0.5	<0.5	<0.5	0.8	1.1	1.4	6.4	<0.5	<0.2	<1	<0.4	<1	<0.5
MW2_4.5	MW02	4.5	17/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5
MW3_0.8	MW03	0.8	18/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5
QA1	MW03	0.8	17/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5
QA2	MW03	0.8	18/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5
MW04_0.5	MW04	0.5	30/09/2020	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	1.9	2	1	1	1.1	0.8	1.1	0.7	<0.5	0.8	1.5	1.7	2	11.1	-	-	-	-	-	-
MW04_1.2	MW04	1.2	30/09/2020	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	-	-	-	-	-
MW05_0.2	MW05	0.2	30/09/2020	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	-	-	-	-	-
QA100	MW05	0.2	30/09/2020	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	-	-	-	-	-
MW05_3.0	MW05	3	30/09/2020	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	-	-	-	-	-
MW06_1.2	MW06	1.2	30/09/2020	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	0.6	-	-	-	-	-	-

				Halogenated Phenols						Organochlorine Pesticides																											
				2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,6-dichlorophenol	2-chlorophenol	Pentachlorophenol	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Toxaphene
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				1	1	0.5	0.5	0.5	1	0.05	0.05	0.05	0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.2	1
CRCCARE 2011 Soil HSL for Direct Contact, HSL-D Com/Ind																																					
0-1m																																					
NEPM 2013 HIL, Residential B									130				10		90						600		400				20				10		15	500	30
NEPM 2013 Soil HSL Commercial/Industrial D, for Vapour Intrusion, Sand																																					
0-1m																																					
1-2m																																					
2-4m																																					
>4m																																					
Sample ID	**Location ID**	**Sample Depth**	**Sample Date**																																		
BH1_1.0-1.5	BH01	1-1.5	18/01/2017	<1	<1	<0.5	-	<0.5	<1	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH1_2.4	BH01	2.4	18/01/2017	<1	<1	<0.5	-	<0.5	<1	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH2_0.5	BH02	0.5	18/01/2017	<1	<1	<0.5	-	<0.5	<1	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH2_2.4	BH02	2.4	18/01/2017	<1	<1	<0.5	-	<0.5	<1	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH3_1.8	BH03	1.8	18/01/2017	<1	<1	<0.5	-	<0.5	<1	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH3_3.0	BH03	3	18/01/2017	<1	<1	<0.5	-	<0.5	<1	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH4_1.5	BH04	1.5	18/01/2017	<1	<1	<0.5	-	<0.5	<1	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH4_2.5	BH04	2.5	18/01/2017	<1	<1	<0.5	-	1.8	<1	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH5_0.2	BH05	0.2	18/01/2017	<1	<1	<0.5	-	<0.5	<1	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH6_1.2	BH06	1.2	17/01/2017	<1	<1	<0.5	-	<0.5	<1	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH6_1.8	BH06	1.8	17/01/2017	<1	<1	<0.5	-	<0.5	<1	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH7_0.2	BH07	0.2	18/01/2017	<1	<1	<0.5	-	<0.5	<1	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH8_0.5	BH08	0.5	17/01/2017	<1	<1	<0.5	-	<0.5	<1	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH9_1.0	BH09	1	17/01/2017	<1	<1	<0.5	-	<0.5	<1	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH10_1.8	BH10	1.8	17/01/2017	<1	<1	<0.5	-	<0.5	<1	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH11_3.2	BH11	3.2	30/09/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11_4.5	BH11	4.5	30/09/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11_5.0	BH11	5	30/09/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW1_0.8	MW01	0.8	18/01/2017	<1	<1	<0.5	-	<0.5	<1	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
MW1_4.0	MW01	4	18/01/2017	<1	<1	<0.5	-	<0.5	<1	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
MW2_1.0	MW02	1	17/01/2017	<1	<1	<0.5	-	<0.5	<1	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
MW2_4.5	MW02	4.5	17/01/2017	<1	<1	<0.5	-	<0.5	<1	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
MW3_0.8	MW03	0.8	18/01/2017	<1	<1	<0.5	-	<0.5	<1	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
QA1	MW03	0.8	17/01/2017	<1	<1	<0.5	-	<0.5	<1	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
QA2	MW03	0.8	18/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	-
MW04_0.5	MW04	0.5	30/09/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW04_1.2	MW04	1.2	30/09/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW05_0.2	MW05	0.2	30/09/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA100	MW05	0.2	30/09/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW05_3.0	MW05	3	30/09/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW06_1.2	MW06	1.2	30/09/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

	Polychlorinated Biphenyls							
	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	PCBs (Sum of total)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.5	0.1	0.5	0.5	0.5	0.5	0.5	0.5
CRCCARE 2011 Soil HSL for Direct Contact, HSL-D Com/Ind								
0-1m								
NEPM 2013 HIL, Residential B								1
NEPM 2013 Soil HSL Commercial/Industrial D, for Vapour Intrusion, Sand								
0-1m								
1-2m								
2-4m								
>4m								
Sample ID	**Location ID**	**Sample Depth**	**Sample Date**					
BH1_1.0-1.5	BH01	1-1.5	18/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH1_2.4	BH01	2.4	18/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH2_0.5	BH02	0.5	18/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH2_2.4	BH02	2.4	18/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH3_1.8	BH03	1.8	18/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH3_3.0	BH03	3	18/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH4_1.5	BH04	1.5	18/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH4_2.5	BH04	2.5	18/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH5_0.2	BH05	0.2	18/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH6_1.2	BH06	1.2	17/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH6_1.8	BH06	1.8	17/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH7_0.2	BH07	0.2	18/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH8_0.5	BH08	0.5	17/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH9_1.0	BH09	1	17/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH10_1.8	BH10	1.8	17/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH11_3.2	BH11	3.2	30/09/2020	-	-	-	-	-	-	-	-
BH11_4.5	BH11	4.5	30/09/2020	-	-	-	-	-	-	-	-
BH11_5.0	BH11	5	30/09/2020	-	-	-	-	-	-	-	-
MW1_0.8	MW01	0.8	18/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW1_4.0	MW01	4	18/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW2_1.0	MW02	1	17/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW2_4.5	MW02	4.5	17/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW3_0.8	MW03	0.8	18/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
QA1	MW03	0.8	17/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
QA2	MW03	0.8	18/01/2017	-	-	-	-	-	-	-	<0.1
MW04_0.5	MW04	0.5	30/09/2020	-	-	-	-	-	-	-	-
MW04_1.2	MW04	1.2	30/09/2020	-	-	-	-	-	-	-	-
MW05_0.2	MW05	0.2	30/09/2020	-	-	-	-	-	-	-	-
QA100	MW05	0.2	30/09/2020	-	-	-	-	-	-	-	-
MW05_3.0	MW05	3	30/09/2020	-	-	-	-	-	-	-	-
MW06_1.2	MW06	1.2	30/09/2020	-	-	-	-	-	-	-	-

	TPH					CRC Care TPH Fractions							BTEX							Metals								Inorganics	
	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)	C6-C10	C10-C16	C16-C34	C34-C40	C10 - C40 (Sum of total)	F1: C6-C10 less BTEX	F2: >C10-C16 less NAPHTHALENE	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Total BTEX	Xylene Total	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	Moisture	Moisture Content (dried @ 103°C)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%
EQL	20	20	50	50	50	20	50	100	100	100	20	50	0.1	0.1	0.1	0.2	0.1	0.2	0.3	2	0.4	5	5	5	0.1	5	5	1	1
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged																													
0-2m																				100		190	60	1100		30	70		
NEPM 2013 ESL UR/POS, Coarse Soil																													
0-2m		120					120	300	2800		180		50	85	70				105										
CRC Care (2017) Technical Report 39 - Benzo(a)pyrene																													
NEPM 2013 Management Limits, C/I, Coarse Soil	700	1000				700	1000	3500	10000																				
Sample ID	**Location ID**	**Sample Depth**	**Sample Date**																										
BH1_1.0-1.5	BH01	1-1.5	18/01/2017	<20	<20	<50	<50	<50	<20	<50	<100	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	19	<0.4	16	88	32	<0.1	6.6	72	-	23
BH1_2.4	BH01	2.4	18/01/2017	<20	<20	<50	<50	<50	<20	<50	<100	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	8.9	<0.4	9.5	11	15	<0.1	<5	<5	-	19
BH2_0.5	BH02	0.5	18/01/2017	<20	<20	<50	<50	<50	<20	<50	<100	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	350	<0.4	8.9	45	63	0.7	8.6	240	-	14
BH2_2.4	BH02	2.4	18/01/2017	<20	<20	<50	<50	<50	<20	<50	<100	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	13	<0.4	46	7	27	<0.1	<5	6.7	-	17
BH3_1.8	BH03	1.8	18/01/2017	<20	<20	1100	1100	2200	<20	<50	1900	680	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	9.4	<0.4	30	9.2	31	<0.1	5.6	6.4	-	33
BH3_3.0	BH03	3	18/01/2017	<20	<20	70	50	120	<20	<50	<100	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	15	<0.4	53	6.2	29	<0.1	<5	9.3	-	29
BH4_1.5	BH04	1.5	18/01/2017	<20	29	1600	1500	3129	<20	<50	2600	900	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	32	<0.4	24	33	220	<0.1	<5	120	-	22
BH4_2.5	BH04	2.5	18/01/2017	20	190	7900	7200	15,290	31	240	13,000	4700	-	31	240	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	6.2	<0.4	21	21	170	<0.1	6.1	270	-	34
BH5_0.2	BH05	0.2	18/01/2017	<20	20	310	170	500	<20	<50	410	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	6.4	<0.4	6.7	37	24	<0.1	12	70	-	8.1
BH6_1.2	BH06	1.2	17/01/2017	<20	<20	96	<50	96	<20	<50	120	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	14	0.7	33	26	240	<0.1	9.1	500	-	23
BH6_1.8	BH06	1.8	17/01/2017	<20	<20	<50	<50	<50	<20	<50	<100	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	9.6	<0.4	26	<5	20	<0.1	<5	<5	-	24
BH7_0.2	BH07	0.2	18/01/2017	<20	<20	100	<50	100	<20	<50	110	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	8.2	<0.4	23	11	160	<0.1	<5	130	-	20
BH8_0.5	BH08	0.5	17/01/2017	<20	<20	200	<50	200	<20	<50	190	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	6.4	<0.4	16	13	180	<0.1	<5	76	-	18
BH9_1.0	BH09	1	17/01/2017	<20	<20	56	<50	56	<20	<50	<100	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	11	<0.4	26	5.4	25	<0.1	<5	5.8	-	24
BH10_1.8	BH10	1.8	17/01/2017	<20	<20	<50	<50	<50	<20	<50	<100	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<2	<0.4	5.9	6.2	15	<0.1	<5	<5	-	20
BH11_3.2	BH11	3.2	30/09/2020	<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<2	<0.4	12	16	16	<0.1	<5	16	-	19
BH11_4.5	BH11	4.5	30/09/2020	<20	<20	190	370	560	<20	<50	450	270	720	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	9.2	<0.4	17	29	35	<0.1	<5	61	-	17
BH11_5.0	BH11	5	30/09/2020	<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	-	-	-	-	-	-	-	-	-	20
MW1_0.8	MW01	0.8	18/01/2017	<20	<20	1000	960	1960	<20	<50	1700	600	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	11	<0.4	17	33	110	0.2	6.4	150	-	21
MW1_4.0	MW01	4	18/01/2017	<20	20	220	190	430	<20	<50	350	110	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	13	<0.4	11	33	25	<0.1	<5	20	-	17
MW2_1.0	MW02	1	17/01/2017	<20	<20	77	<50	77	<20	<50	<100	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	5.3	<0.4	13	48	300	0.9	5.1	500	-	17
MW2_4.5	MW02	4.5	17/01/2017	<20	<20	<50	<50	<50	<20	<50	<100	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	11	<0.4	7.4	19	430	0.1	5.2	350	-	17
MW3_0.8	MW03	0.8	18/01/2017	<20	<20	89	<50	89	<20	<50	<100	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	8.9	<0.4	6.9	22	71	<0.1	16	55	-	26
QA1	MW03	0.8	17/01/2017	<20	<20	66	<50	66	<20	<50	<100	<100	-	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	10	<0.4	7.6	28	87	<0.1	15	68	-	8.6
QA2	MW03	0.8	18/01/2017	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<10	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.2	<0.5	8	<1	6	22	61	<0.1	12	60	16.2	-
MW04_0.5	MW04	0.5	30/09/2020	<20	<20	62	80	142	<20	<50	110	<100	110	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	8.1	<0.4	32	20	56	<0.1	11	61	-	24
MW04_1.2	MW04	1.2	30/09/2020	<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	14	<0.4	54	10	34	<0.1	8.4	8.5	-	28
MW05_0.2	MW05	0.2	30/09/2020	<20	<20	<50	71	71	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	3.6	<0.4	33	650	96	0.1	93	390	-	7.6
QA100	MW05	0.2	30/09/2020	<20	<20	75	130	205	<20	<50	160	110	270	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	5.2	<0.4	34	1300	310	0.3	97	560	-	6.2
MW05_3.0	MW05	3	30/09/2020	<20	<20	<50	<50	<50	<20	<50	<100	<100	<100	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	15	<0.4	46	22	38	<0.1	5	19	-	24
MW06_1.2	MW06	1.2	30/09/2020	<20	25	1100	1700	2825	<20	<50	2400	960	3360	<20	<50	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	20	<0.4	19	130	300	0.5	25	230	-	18

				PAH																				Phenols						Halogenated Phenols					
				Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(k)fluoranthene	Benzo(b+j)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenzo(a,h)anthracene	Benzo(g,h,i)perylene	Benzo(a)pyrene TEQ (Zero LOR)	Benzo(a)pyrene TEQ (Half LOR)	Benzo(a)pyrene TEQ (Full LOR)	PAHs (Sum of total)	2,4-dimethylphenol	2-methylphenol	2-nitrophenol	3-&4-methylphenol	4-chloro-3-methylphenol	Phenol	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,6-dichlorophenol	2-chlorophenol	Pentachlorophenol
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.2	1	0.4	1	0.5	1	1	0.5	0.5	0.5	1
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged																																			
0-2m				170																															
NEPM 2013 ESL UR/POS, Coarse Soil																																			
0-2m																0.7																			
CRC Care (2017) Technical Report 39 - Benzo(a)pyrene																20																			
NEPM 2013 Management Limits, C/I, Coarse Soil																																			
Sample ID	**Location ID**	**Sample Depth**	**Sample Date**																																
BH1_1.0-1.5	BH01	1-1.5	18/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5	<1	<1	<0.5	-	<0.5	<1
BH1_2.4	BH01	2.4	18/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5	<1	<1	<0.5	-	<0.5	<1
BH2_0.5	BH02	0.5	18/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5	<1	<1	<0.5	-	<0.5	<1
BH2_2.4	BH02	2.4	18/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5	<1	<1	<0.5	-	<0.5	<1
BH3_1.8	BH03	1.8	18/01/2017	<0.5 - 0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	0.8	<0.5	<0.2	<1	<0.4	<1	<0.5	<1	<1	<0.5	-	<0.5	<1
BH3_3.0	BH03	3	18/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5	<1	<1	<0.5	-	<0.5	<1
BH4_1.5	BH04	1.5	18/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5	<1	<1	<0.5	-	<0.5	<1
BH4_2.5	BH04	2.5	18/01/2017	<0.5 - 1.7	<0.5	<0.5	0.7	1.4	<0.5	0.7	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	5.7	<0.5	<0.2	<1	<0.4	<1	<0.5	<1	<1	<0.5	-	1.8	<1
BH5_0.2	BH05	0.2	18/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5	<1	<1	<0.5	-	<0.5	<1
BH6_1.2	BH06	1.2	17/01/2017	<0.5	<0.5	<0.5	<0.5	1.2	<0.5	4	4.1	2.4	2.1	2.1	3.1	2.5	1.8	<0.5	2.6	3.5	3.7	4	25.9	<0.5	<0.2	<1	<0.4	<1	<0.5	<1	<1	<0.5	-	<0.5	<1
BH6_1.8	BH06	1.8	17/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5	<1	<1	<0.5	-	<0.5	<1
BH7_0.2	BH07	0.2	18/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5	<1	<1	<0.5	-	<0.5	<1
BH8_0.5	BH08	0.5	17/01/2017	<0.5	1.2	<0.5	<0.5	8.1	2.1	12	10	4.9	4.1	3.7	4.9	4.3	2.7	0.8	3	6.8	6.8	6.8	61.8	<0.5	<0.2	<1	<0.4	<1	<0.5	<1	<1	<0.5	-	<0.5	<1
BH9_1.0	BH09	1	17/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5	<1	<1	<0.5	-	<0.5	<1
BH10_1.8	BH10	1.8	17/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5	<1	<1	<0.5	-	<0.5	<1
BH11_3.2	BH11	3.2	30/09/2020	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
BH11_4.5	BH11	4.5	30/09/2020	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
BH11_5.0	BH11	5	30/09/2020	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW1_0.8	MW01	0.8	18/01/2017	<0.5	<0.5	<0.5	<0.5	0.9	<0.5	1.2	1.4	0.5	0.7	0.7	0.7	0.7	<0.5	<0.5	<0.5	0.9	1.2	1.5	6.8	<0.5	<0.2	<1	<0.4	<1	<0.5	<1	<1	<0.5	-	<0.5	<1
MW1_4.0	MW01	4	18/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5	<1	<1	<0.5	-	<0.5	<1
MW2_1.0	MW02	1	17/01/2017	<0.5	<0.5	<0.5	<0.5	0.8	<0.5	1.1	1.1	0.8	0.7	0.5	0.8	0.6	<0.5	<0.5	<0.5	0.8	1.1	1.4	6.4	<0.5	<0.2	<1	<0.4	<1	<0.5	<1	<1	<0.5	-	<0.5	<1
MW2_4.5	MW02	4.5	17/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5	<1	<1	<0.5	-	<0.5	<1
MW3_0.8	MW03	0.8	18/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5	<1	<1	<0.5	-	<0.5	<1
QA1	MW03	0.8	17/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.2	<1	<0.4	<1	<0.5	<1	<1	<0.5	-	<0.5	<1
QA2	MW03	0.8	18/01/2017	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2
MW04_0.5	MW04	0.5	30/09/2020	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	1.9	2	1	1	1.1	0.8	1.1	0.7	<0.5	0.8	1.5	1.7	2	11.1	-	-	-	-	-	-	-	-	-	-	-	-
MW04_1.2	MW04	1.2	30/09/2020	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
MW05_0.2	MW05	0.2	30/09/2020	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
QA100	MW05	0.2	30/09/2020	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
MW05_3.0	MW05	3	30/09/2020	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	-	-	-	-	-	-	-	-	-	-	-
MW06_1.2	MW06	1.2	30/09/2020	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	0.6	-	-	-	-	-	-	-	-	-	-	-	-

				Organochlorine Pesticides																								
				4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Toxaphene
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.05	0.05	0.05	0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.2	1
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged																													
0-2m														180															
NEPM 2013 ESL UR/POS, Coarse Soil																													
0-2m																													
CRC Care (2017) Technical Report 39 - Benzo(a)pyrene																													
NEPM 2013 Management Limits, C/I, Coarse Soil																													
Sample ID	**Location ID**	**Sample Depth**	**Sample Date**																										
BH1_1.0-1.5	BH01	1-1.5	18/01/2017	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH1_2.4	BH01	2.4	18/01/2017	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH2_0.5	BH02	0.5	18/01/2017	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH2_2.4	BH02	2.4	18/01/2017	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH3_1.8	BH03	1.8	18/01/2017	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH3_3.0	BH03	3	18/01/2017	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH4_1.5	BH04	1.5	18/01/2017	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH4_2.5	BH04	2.5	18/01/2017	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH5_0.2	BH05	0.2	18/01/2017	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH6_1.2	BH06	1.2	17/01/2017	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH6_1.8	BH06	1.8	17/01/2017	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH7_0.2	BH07	0.2	18/01/2017	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH8_0.5	BH08	0.5	17/01/2017	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH9_1.0	BH09	1	17/01/2017	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH10_1.8	BH10	1.8	17/01/2017	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
BH11_3.2	BH11	3.2	30/09/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11_4.5	BH11	4.5	30/09/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11_5.0	BH11	5	30/09/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW1_0.8	MW01	0.8	18/01/2017	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
MW1_4.0	MW01	4	18/01/2017	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
MW2_1.0	MW02	1	17/01/2017	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
MW2_4.5	MW02	4.5	17/01/2017	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
MW3_0.8	MW03	0.8	18/01/2017	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
QA1	MW03	0.8	17/01/2017	<0.05	<0.05	<0.05	-	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
QA2	MW03	0.8	18/01/2017	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	-
MW04_0.5	MW04	0.5	30/09/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW04_1.2	MW04	1.2	30/09/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW05_0.2	MW05	0.2	30/09/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA100	MW05	0.2	30/09/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW05_3.0	MW05	3	30/09/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW06_1.2	MW06	1.2	30/09/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

				Polychlorinated Biphenyls							
				Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	PCBs (Sum of total)
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.5	0.1	0.5	0.5	0.5	0.5	0.5	0.5
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged											
0-2m											
NEPM 2013 ESL UR/POS, Coarse Soil											
0-2m											
CRC Care (2017) Technical Report 39 - Benzo(a)pyrene											
NEPM 2013 Management Limits, C/I, Coarse Soil											
Sample ID	**Location ID**	**Sample Depth**	**Sample Date**								
BH1_1.0-1.5	BH01	1-1.5	18/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH1_2.4	BH01	2.4	18/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH2_0.5	BH02	0.5	18/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH2_2.4	BH02	2.4	18/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH3_1.8	BH03	1.8	18/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH3_3.0	BH03	3	18/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH4_1.5	BH04	1.5	18/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH4_2.5	BH04	2.5	18/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH5_0.2	BH05	0.2	18/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH6_1.2	BH06	1.2	17/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH6_1.8	BH06	1.8	17/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH7_0.2	BH07	0.2	18/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH8_0.5	BH08	0.5	17/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH9_1.0	BH09	1	17/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH10_1.8	BH10	1.8	17/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH11_3.2	BH11	3.2	30/09/2020	-	-	-	-	-	-	-	-
BH11_4.5	BH11	4.5	30/09/2020	-	-	-	-	-	-	-	-
BH11_5.0	BH11	5	30/09/2020	-	-	-	-	-	-	-	-
MW1_0.8	MW01	0.8	18/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW1_4.0	MW01	4	18/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW2_1.0	MW02	1	17/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW2_4.5	MW02	4.5	17/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW3_0.8	MW03	0.8	18/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
QA1	MW03	0.8	17/01/2017	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
QA2	MW03	0.8	18/01/2017	-	-	-	-	-	-	-	<0.1
MW04_0.5	MW04	0.5	30/09/2020	-	-	-	-	-	-	-	-
MW04_1.2	MW04	1.2	30/09/2020	-	-	-	-	-	-	-	-
MW05_0.2	MW05	0.2	30/09/2020	-	-	-	-	-	-	-	-
QA100	MW05	0.2	30/09/2020	-	-	-	-	-	-	-	-
MW05_3.0	MW05	3	30/09/2020	-	-	-	-	-	-	-	-
MW06_1.2	MW06	1.2	30/09/2020	-	-	-	-	-	-	-	-

			TPH					CRC Care TPH Fractions							BTEX						Metals																	
			C6 - C9	C10 - C14	C15 - C28	C29-C36	>C10 - C36 (Sum of total)	C6-C10	>C10-C16	>C16-C34	>C34-C40	>C10 - C40 (Sum of total)	F1: C6-C10 less BTEX	F2: >C10-C16 less NAPHTHALENE	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	Arsenic	Arsenic (Filtered)	Cadmium	Cadmium (Filtered)	Chromium (III+VI)	Chromium (III+VI) (Filtered)	Copper	Copper (Filtered)	Lead	Lead (Filtered)	Mercury	Mercury (Filtered)	Nickel	Nickel (Filtered)	Zinc	Zinc (Filtered)
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	ug/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L
EQL			20	50	100	100	100	20	50	100	100	100	20	50	1	1	1	2	1	3	1	1	0.2	0.2	1	1	1	1	0.001	0.001	0.0001	0.0001	0.001	0.001	5	5
ADWG 2015 Health															1	800	300			600	10	10	2	2			2000	2000	0.01	0.01	0.001	0.001	0.02	0.02		
ANZG (2018) Freshwater (unknown reliability) toxicant DGVs																180	80																			
ANZG (2018) Freshwater 95% toxicant DGVs															950				350				0.2	0.2			1.4	1.4	0.0034	0.0034			0.011	0.011	8	8
ANZG (2018) Freshwater 99% toxicant DGVs																																				
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand																															0.00006	0.00006				
2-4m													1000	1000	800	NL	NL			NL																
4-8m													1000	1000	800	NL	NL			NL																
>8m													1000	1000	900	NL	NL			NL																
Sample ID	**Location ID**	**Sample Date**																																		
MW1	MW01	7/02/2017	<20	<50	<100	<100	<100	<20	<50	<100	<100	-	<20	<50	<1	<1	<1	<2	<1	<3	-	1	-	<0.2	-	<1	-	3	-	<0.001	-	<0.0001	-	0.029	-	180
MW01	MW01	7/10/2020	<20	<50	<100	<100	<100	<20	<50	<100	<100	<100	<20	<50	<1	<1	<1	<2	<1	<3	2	1	<0.2	<0.2	1	<1	7	10	0.002	<0.001	<0.0001	<0.0001	0.014	0.013	84	70
MW2	MW02	7/02/2017	<20	<50	<100	<100	<100	<20	<50	<100	<100	-	<20	<50	<1	<1	<1	<2	<1	<3	-	<1	-	<0.2	-	<1	-	6	-	<0.001	-	<0.0001	-	0.003	-	68
MW02	MW02	7/10/2020	<20	<50	<100	<100	<100	<20	<50	<100	<100	<100	<20	<50	<1	<1	<1	<2	<1	<3	<1	1	<0.2	<0.2	2	1	24	22	0.005	0.004	<0.0001	<0.0001	0.002	0.002	34	32
MW3	MW03	7/02/2017	<20	<50	<100	<100	<100	<20	<50	<100	<100	-	<20	<50	<1	<1	<1	<2	<1	<3	-	<1	-	<0.2	-	<1	-	4	-	<0.001	-	<0.0001	-	0.008	-	44
MW03	MW03	7/10/2020	<20	<50	<100	<100	<100	<20	<50	<100	<100	<100	<20	<50	<1	<1	<1	<2	<1	<3	2	<1	<0.2	<0.2	2	<1	6	6	0.001	<0.001	0.0003	<0.0001	0.002	0.001	10	6
QA100	MW03	7/10/2020	<20	<50	<100	<100	<100	<20	<50	<100	<100	<100	<20	<50	<1	<1	<1	<2	<1	<3	2	<1	<0.2	<0.2	2	<1	10	5	0.002	<0.001	0.0004	<0.0001	0.002	0.002	15	6
MW04	MW04	7/10/2020	<20	<50	<100	<100	<100	<20	<50	<100	<100	<100	<20	<50	<1	<1	<1	<2	<1	<3	3	2	0.9	0.9	<1	<1	110	62	0.001	<0.001	<0.0001	<0.0001	0.087	0.081	2900	2800
MW05	MW05	7/10/2020	<20	<50	400	<100	400	<20	<50	300	<100	300	<20	<50	<1	<1	<1	<2	<1	<3	2	1	0.3	0.2	2	<1	35	2	0.017	<0.001	<0.0001	<0.0001	0.023	0.016	220	160
MW06	MW06	7/10/2020	<20	60	1300	1500	2860	<20	90	2400	1000	3490	<20	90	<1	<1	<1	<2	<1	<3	45	2	0.6	<0.2	14	<1	170	2	0.53	<0.001	0.0009	<0.0001	0.02	0.006	430	15

			PAH																Organochlorine Pesticides																							
			Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(k)fluoranthene	Benzo(b+j)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenzo(a,h)anthracene	Benzo(g,h,i)perylene	PAHs (Sum of total)	4,4-DDE	a-BHC	Aldrin	b-BHC	Chlordane	g-BHC	DDD	DDT	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Toxaphene
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L
EQL			1	1	1	1	1	1	1	1	1	1	1	1	0.001	1	1	1	1	0.1	0.1	0.1	0.1	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.01
ADWG 2015 Health															0.00001									2			9							10	0.3						
ANZG (2018) Freshwater (unknown reliability) toxicant DGVs							0.6	0.1	1						0.0001					0.03		0.001					0.01											0.05	0.005	
ANZG (2018) Freshwater 95% toxicant DGVs			16																					0.08			0.01					0.02			0.2	0.09				0.0002
ANZG (2018) Freshwater 99% toxicant DGVs																																									
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand																																								
2-4m			NL																																						
4-8m			NL																																						
>8m			NL																																							
Sample ID	**Location ID**	**Sample Date**																																								
MW1	MW01	7/02/2017	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.001	<1	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.01
MW01	MW01	7/10/2020	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.001	<1	<1	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW2	MW02	7/02/2017	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.001	<1	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.01
MW02	MW02	7/10/2020	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.001	<1	<1	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW3	MW03	7/02/2017	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.001	<1	<1	<1	<1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.01
MW03	MW03	7/10/2020	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.001	<1	<1	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA100	MW03	7/10/2020	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.001	<1	<1	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW04	MW04	7/10/2020	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.001	<1	<1	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW05	MW05	7/10/2020	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.001	<1	<1	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW06	MW06	7/10/2020	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.001	<1	<1	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

			Polychlorinated Biphenyls							
			Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	PCBs (Sum of total)
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			1	1	1	1	1	1	1	1
ADWG 2015 Health										
ANZG (2018) Freshwater (unknown reliability) toxicant DGVs										
ANZG (2018) Freshwater 95% toxicant DGVs						0.6		0.03		
ANZG (2018) Freshwater 99% toxicant DGVs										
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand										
2-4m										
4-8m										
>8m										
Sample ID	**Location ID**	**Sample Date**								
MW1	MW01	7/02/2017	<1	<1	<1	<1	<1	<1	<1	<1
MW01	MW01	7/10/2020	-	-	-	-	-	-	-	-
MW2	MW02	7/02/2017	<1	<1	<1	<1	<1	<1	<1	<1
MW02	MW02	7/10/2020	-	-	-	-	-	-	-	-
MW3	MW03	7/02/2017	<1	<1	<1	<1	<1	<1	<1	<1
MW03	MW03	7/10/2020	-	-	-	-	-	-	-	-
QA100	MW03	7/10/2020	-	-	-	-	-	-	-	-
MW04	MW04	7/10/2020	-	-	-	-	-	-	-	-
MW05	MW05	7/10/2020	-	-	-	-	-	-	-	-
MW06	MW06	7/10/2020	-	-	-	-	-	-	-	-

About Cardno

Cardno is a professional infrastructure and environmental services company, with expertise in the development and improvement of physical and social infrastructure for communities around the world. Cardno's team includes leading professionals who plan, design, manage and deliver sustainable projects and community programs. Cardno is an international company listed on the Australian Securities Exchange [ASX:CDD].

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