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14 November 2022

Liam Hearne, Senior Project Manager
TSA on behalf of Health Infrastructure
Level 24, Allendale Square
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Dear Liam

Interim Site Audit Advice No 01, BE167, Royal Prince Alfred Hospital, Remediation Action Plan review

1.0 Introduction and Site Audit Background

Brad Eismen (NSW Site Auditor No 0102 – 'the Auditor') of AECOM Australia Pty Ltd (AECOM), was engaged by Health Infrastructure to conduct a site audit (BE167) as per the NSW Contaminated Management (CLM) Act (1997) for redevelopment activities at the Royal Prince Alfred Hospital (RPA), located in Camperdown, NSW. It is understood that the site audit will be conducted in stages during redevelopment of the East and West Campuses, with interim site audit advice (ISAA) required for the various stages.

This ISAA addresses a planning consent condition and specifically assesses the adequacy of the Cardno (2022j) Remediation Action Plan (RAP) to make the site suitable for the continued use, including hospital and associated open space. It is therefore considered a statutory site audit under the CLM Act. The Auditor was assisted by Mr Jonathan Ho of AECOM.

In this ISAA, the Auditor has provided a summary of his review and related Auditor's Comments pertaining to the information provided in the Cardno (2022j) RAP. Italicised text is verbatim from the Cardno documents.

The Auditor notes the following:

- This ISAA does not constitute a site audit report or statement.
- This ISAA is considered by the Auditor to be consistent with NSW EPA guidelines and policies.
- This ISAA will be documented in the final Site Audit Statement(s) and associated documentation.
- At the completion of the site audit, a Site Audit Statement will be prepared, for the consent agency to include in the Site's property information, held by the local council.

2.0 Documents Reviewed

The following document is the primary focus of this ISAA, as required by the planning consent:

- Cardno, 2022j. Remediation Action Plan, Royal Prince Alfred Hospital. Cardno Ref: 80022026_R004_RPA East Campus_RAP_Rev0.docx. 10 November.

Other documentation considered in the preparation of this ISAA included:

- Cardno, 2022e. Detailed Site Investigation Report, Royal Prince Alfred Hospital, East Campus. Cardno Ref: 80022026_R001_EastCampus_Detailed Site Investigation Rev0 dated 5 October 2022
- Cardno, 2022f. Remediation Action Plan, Royal Prince Alfred Hospital. Cardno Ref: 80022026_R004_RPA East Campus_RAP_RevA.docx. 14 October.
- Cardno, 2022g. Detailed Site Investigation Report, Royal Prince Alfred Hospital, East Campus. Cardno Ref: 80022026_R001_EastCampus_Detailed Site Investigation RevB. 4 November.
- Cardno, 2022h. Remediation Action Plan, Royal Prince Alfred Hospital. Cardno Ref: 80022026_R004_RPA East Campus_RAP_RevB.docx. 4 November.
- Cardno, 2022i. Detailed Site Investigation Report, Royal Prince Alfred Hospital, East Campus. Cardno Ref: 80022026_R001_EastCampus_Detailed Site Investigation Rev1. 10 November.

- Various drawings from the RPA-ARC-BSA-DRG-DA drawing set (RPA-ARC-BSA-DRG-MW-DA0001, RPA-ARC-BSA-DRG-MW-DA0102, RPA-ARC-BSA-DRG-MW-DA0103, RPA-ARC-BSA-DRG-MW-DA0104, RPA-ARC-BSA-DRG-MW-DA0901, RPA-ARC-BSA-DRG-MW-DA0902, RPA-ARC-BSA-DRG-MW-DA1001, RPA-ARC-BSA-DRG-MW-DA1002)
- HI, 2022. Royal Prince Alfred Hospital Redevelopment State Significant Development Application Design Report. October.

3.0 Previous Site Audit Memos

The following Site Audit Memos (SAMs) have been issued. AECOM (2022b), including Cardno's responses, is attached as it is directly related to this ISAA.

- AECOM, 2022a. RPA East Campus, Site Audit BE167 Site Audit Memo 01. 19 October.
- AECOM, 2022b. RPA East Campus, Site Audit BE167 Site Audit Memo 02. 7 November.

4.0 Remediation Objectives

The Cardno (2022j) RAP provided the following purpose and objectives of the RAP:

> *The purpose of the proposed remedial works is to remove the bonded asbestos and B(α)P TEQ contaminated soils that currently exceed human health soil criteria and that pose a potential risk to human health; and to remove the copper, zinc and B(α)P contaminated soils that exceed the ecological criteria, thus ensuring the suitability of the site for the continued hospital use.*
>
> *The remediation objectives are:*
>
> > *To ensure that soil and groundwater characterisation are completed across the areas where the quality of the soil and groundwater are unknow.*
> >
> > *To ensure the identified asbestos and B(α)P-TEQ contaminated soils are appropriately managed so that they do not pose risk to human health and the environment at the site for the future land use;*
> >
> > *To ensure the identified copper, zinc and B(α)P contaminated soils are appropriately managed so that they do not pose ecological risk for the future land use; and*
> >
> > *To validate that the requirements of this RAP have been successfully completed such that the site is suitable for the proposed concept development as high-density residential land use.*

Auditor's Comments

The Auditor considers that the stated purpose and overall objectives are appropriate and consistent with the NSW EPA (2020) reporting guidelines.

The Auditor understands that the site will continue to be used as a hospital and accompanying open space. However, as discussed in Section 8.0, the proposed remediation criteria for building footprint areas are high density residential land use and low-density residential.

5.0 Site Identification

The Cardno (2022j) RAP provided the following site identification details.

Table 1 Site Identification (Table 2-1 Cardno 2022j)

Details	Comments
Address	RPA Hospital – John Hopkins Drive and Lambie Dew Drive, Camperdown NSW, and part of Sydney University grounds
Applicable Lot and Deposited Plan	Part of Lot 1000 DP 1159799 (lands within RPA Hospital); and Part of Lot 1 DP1171804 and part of Lot 1001 DP1159799 (University of Sydney grounds that are to be used for landscaping purposes by RPA. It is unknown if lands are to be acquired of leased).
Eastern Development : East area of Eastern Campus and Maternity Ward Parking Area current land use and total area, including University of Sydney landscaping lands.	Landscaping, access roadways, pathology services and loading bay. Area is predominantly paved with landscaping areas mainly located in the south east. Total area: 8,803m^2. Area was based on *Extent of Works Diagram* Royal Prince Alfred Hospital Redevelopment Stage 1, dwg no. IA021300-SK-2001, dated 11 February 2022; provided by the Client.
Emergency Bay Area	Access roadway, ambulance parking area, covid testing hub. Area is predominantly paved with localised landscaping areas located along the west boundary. Total area: 1212m^2. Area was based on *Extent of Works Diagram* Royal Prince Alfred Hospital Redevelopment Stage 1, dwg no. IA021300-SK-2001, dated 11 February 2022; provided by the Client.
Proposed land use	The land will continue to serve hospital land uses. The development details are summarised in **Section 1.2**.
Local Government Authority (LGA)	City of Sydney Local Government Area
Current zoning (Sydney Local Environmental Plan 2012)	SP2: Infrastructure and Educational Establishment
Site coordinates	- 33.889162, 151.183961

Auditor's Comments

The Auditor considers that the site identification, along with figures and drawings in the Cardno (2022j) RAP and the Cardno (2022i) DSI, generally complies with the NSW EPA (2020) reporting guidelines. The Auditor notes the following:

- This site audit covers part Lot 1000 DP 1159799 and includes the areas that have been investigated and require management/remediation of soil during the proposed redevelopment activities.
- Based on figures in the Cardno (2022j) RAP and the Cardno (2022g) DSI, the area of disturbance (i.e., the area that will potentially be subject to remediation) includes a portion of adjacent Sydney University land, identified as part Lot 1001 DP 1159799 and part Lot 1 DP 1171804. See Figure 1 and Figure 2 below.
- Based on https://www.planningportal.nsw.gov.au/spatialviewer/, Lot 1000 and Lot 1001 DP 1159799 are zoned SP2: Health Services Facilities and Lot 1 DP 1171804 is zoned SP2: Educational Establishment.
- The total area described in Drawing 11/02/22_ IA0251300- SK-SK-2001 Extent of Works Diagram included in the Cardno (2022i) DSI indicated the total area to be 9,995m^2. The site identification table in the DSI indicated the total area to be 9,320m^2 (1,205+155+6,748+1,212) when the areas are added (see Table 2 below). The Auditor considers that these discrepancies should be addressed by providing a survey plan of final the remediated area in the validation report.

Table 2 Site Identification (Table 2-1 Cardno 2022i)

Details	Comments
Address	RPA Hospital – John Hopkins Drive and Lambie Dew Drive, Camperdown NSW
Applicable Lot and Deposited Plan	Part of Lot 1000 DP 1159799 (RPA Hospital grounds); and Part of Lot 1 DP and part of Lot 1001 DP1159799 (University of Sydney grounds which will be used by RPA for landscaping purposes).
Eastern Development: Maternity Ward Parking Area current land use and total area	Landscaping and as a hospital patient drop off point. Area is predominantly paved with the landscaping area located in the north east and west. Total area: 1,2054m^2. Area was based on Jacobs drawing titled *Extent of Works Diagram* Royal Prince Alfred Hospital Redevelopment Stage 1, dwg no. IA021300-SK-2001, dated 11 February 2022; provided by the Client.
Eastern Development : East area of Eastern Campus current land use and total area	Landscaping, access roadways, pathology services and as loading bay. Area is predominantly paved with landscaping areas predominantly located in the southeast. The area also includes an irregularly shaped portion of land (3.5m wide by 46m in length) on University of Sydney lands with a total area of approximately 155 m^2. Total area: 6,748m^2. Area was based on *Extent of Works Diagram* Royal Prince Alfred Hospital Redevelopment Stage 1, dwg no. IA021300-SK-2001, dated 11 February 2022; provided by the Client.
Emergency Bay Area	Access roadway, ambulance parking area, covid testing hub. Area is predominantly paved with localised landscaping areas located along the west boundary. Total area: 1,212m^2. Area was based on *Extent of Works Diagram* Royal Prince Alfred Hospital Redevelopment Stage 1, dwg no. IA021300-SK-2001, dated 11 February 2022; provided by the Client.
Proposed land use	The land will continue to serve hospital land uses. The development details are summarised in **Section 1.2**.
Local Government Authority (LGA)	City of Sydney Local Government Area
Current zoning (Sydney Local Environmental Plan 2012)	SP2: Infrastructure and Educational Establishment
Site coordinates	- 33.889162, 151.183961

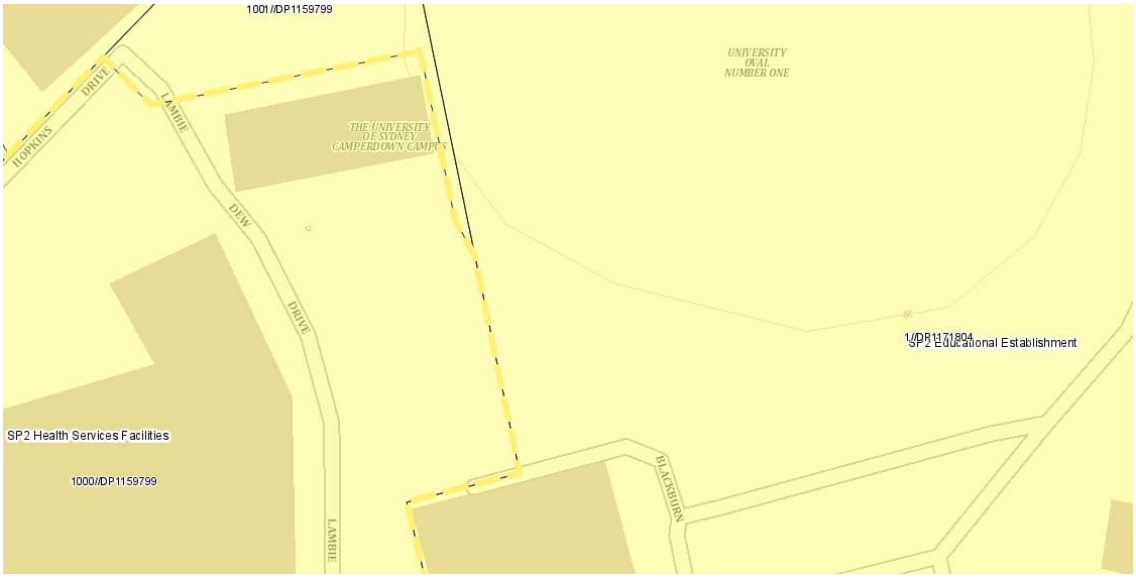


Figure 1 Lot and DP plan from https://www.planningportal.nsw.gov.au/spatialviewer/

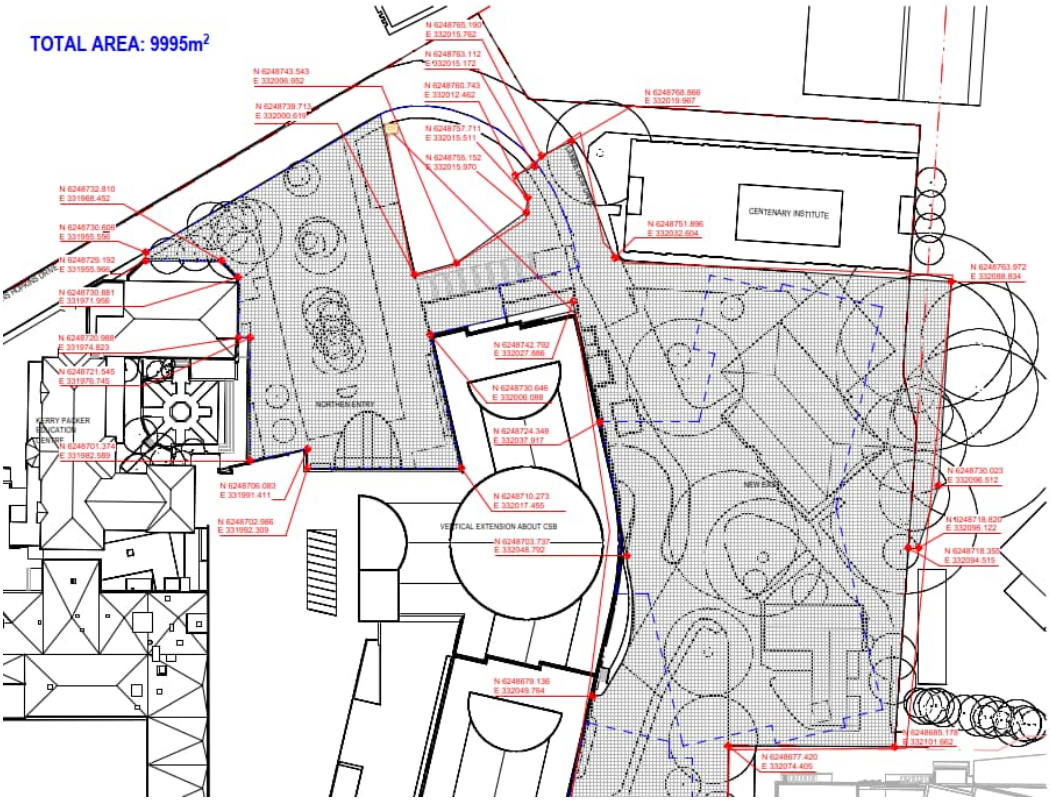


Figure 2 Northeast portion of Drawing 11/02/22_ IA0251300- SK-SK-2001 Extent of Works Diagram

6.0 Site History

The Cardno (2020j) RAP provided the following site history summary, following a request from the Auditor in AECOM (2022b):

> *Based on the previous report reviews, the land use of the Eastern Campus appears to be limited to hospital services / medical health buildings and infrastructure. The grounds of the eastern precinct of the RPA hospital grounds have undergone significant alteration and refurbishment since operations commenced in 1873. Specific activities of relevance to potential contamination that appear to have occurred on site include demolition, filling, storage and handling of dangerous goods, construction electrical substation infrastructure (substation), and the presence of a NSW EPA licence to produce, store and handle hazardous waste.*
>
> *With respect to storage of dangerous goods as indicated in Cardno (2022a):*
>
> - *No dangerous goods appear to have been stored within the EBA, but flammable liquids cabinets were identified within the building 63, which is the building located to the east of the area of investigation.*
> - *No dangerous goods are currently located within the boundaries of the Maternity Ward Parking Area. Historically, within the footprint of this area, storage of medical gas and unspecified liquids in a previously standing gardeners shed were identified.*
> - *Dangerous goods were identified within the boundary of the Eastern Development – East area of Eastern Campus, which includes an underground storage tank containing diesel fuel located within the loading bay area; flammable liquid cabinets containing kerosene, adhesives, acetone, ethanol, methanol, toluene, located to the east of the Pathology building, flammable liquids cabinet containing xylene located within the footprint of the Pathology building.*
> - *Furthermore, a potentially decommissioned underground fuel storage tank(s) (i.e. listed as containing white and methylated spirits) area was identified at distances ranging from 170m south west of the Maternity Ward Parking Area, 160m west of the East area of the*

Eastern Campus and 100m south of the EBA, as shown in Appendix G. It is inferred that these tanks could have been historically decommissioned during past new building construction, however, this is not confirmed.

The surrounding land uses to the north, east and south appear to have generally been occupied by buildings, structures and grounds associated with the Sydney University. West of the eastern precinct is Missenden Road and additional buildings and infrastructure associated with the RPA hospital. A sports oval to the east of the East Campus, situated within the grounds of Sydney University, appears to have existed on this land prior to the earliest available aerial photograph of 1930.

Previous site investigation (Cardno 2022a) indicated that the site target location of the EBA has not varied significantly, however, the historical activities have been limited to use as access way to the main hospital entrance located on Missenden Road.

Based on the information presented across all reports outlined in Section 3.1, the specific activities of relevance to potential contamination for areas of investigation include demolition, weathering of hazardous building materials onto soils or ground surfaces, filling likely imported from coal fired power ash plant as was used across the inner Sydney Area, possible pesticide spraying, leakage from parked motor vehicles and/or UST, and use of chemicals for the operational use of the buildings (Pathology Building and surrounding sheds, chapel) that will be demolished as part of the redevelopment.

Auditor's Comments

The Auditor considers that the requested site history summary was adequate, as required by the NSW EPA (2020) reporting guidelines.

7.0 Surrounding Land Use and Site Setting

The Cardno (2022j) RAP provided the following for surrounding land use.

Table 3 Surrounding land use (Table 2-2 Cardno 2022j)

Direction	Eastern Development : East area of Eastern Campus Surrounding Land Use or Activity	Emergency Bay Area Surrounding Land Use or Activity
North	Centenary Institute, followed by Grose Farm Lane and University of Sydney infrastructure further north	John Hopkins Drive with St John's College further north
East	University of Sydney Campus	RPA Main Hospital Building 63
South	RPA hospital building with the grounds of St Andrews College further south	RPA Main Hospital Building 64 and 65, followed by Gloucester Drive further south
West	RPA hospital building with Missenden Road further west	Missenden Road followed by RPA West Campus Building 13

The Cardno (2022j) RAP provided the following site setting information.

Table 4 Site setting information (Table 2-3 Cardno 2022j)

Item	Details
Regional Soil Landscape	The NSW DPIE *eSPADE* v2.1 website indicated that the site overlies Blacktown (bt) residual soil landscape. Soils within the Blacktown landscape consisted of shallow to moderately deep (<100 cm) red and brown podzolic soils on crests, upper slopes and well drained areas, whilst deep yellow podzolic soils and soloths are evident on lower slopes and in poor drainage areas.
Regional Geology	The Sydney 1:100 000 Geological Map, Herbert C, 1983, illustrates that the subject site ins underlain by Ashfield Shale (Rwa) of Wianamatta Group from Middle Triassic period of Mesozoic era. The map shows the site is underlain by Ashfield Shale (Rwa) which is charactered as Black to dark-grey shale and laminite.
Regional Groundwater	The WaterNSW Real Time Water Data Portal was accessed on 16 February 2022 and registered groundwater bores within a 500 m radius of the site. The five nearest bores included: ▪ GW116424 – no further information available; ▪ GW116421 – no further information available; ▪ GW116422 – no further information available; ▪ GW109230 – installed as a private bore in 2008 with a final depth of 1.80m BGL. The listed intended purpose is as a monitoring bore; and ▪ GW109231 – installed as a private bore in 2008 with a final depth of 3.2m BGL. The listed intended purpose is as a monitoring bore. ▪ As part of Preliminary Site Investigation (Refer to **Section 3**), groundwater levels within the East Campus were measured at depths of 1.68 – 7.81 mBGL.
Surface Water Bodies	The nearest surface water body is Johnstons Creek, which is located approximately 1 km north east of the site and discharges to Rozelle Bay. The site and surrounds are mostly paved and surface water flows, and potentially groundwater migration, are inferred to flow north toward Johnstons Creek.
Acid Sulfate Soils	The NSW Government Planning Industry and Environment online mapping tool, eSPADE Version 2.1, indicates that the site is not mapped as being situated within or near an ASS risk area. The nearest mapped ASS risk area is approximately 600m north west in the vicinity of Johnstons Creek.
Salinity	The Soil Landscape Map accessed from the NSW Government Planning Industry and Environment online mapping tool, eSPADE Version 2.1, indicates that the site lies within the Blacktown Soil Landscape, which typically comprises of four dominant soil materials that overlie Wianamatta geology. 'Localised sodicity' and 'localised salinity' are listed as potential soil limitations of the Blacktown Soil Landscape within the four dominant soils comprising of clays and loams. In the absence of surface salting and obvious corrosion on nearby structures, the likelihood of saline soil existing to a level that could constrain future development is considered low.

Auditor's Comments

The Auditor considers that the surrounding land use and site setting, including geology, soil and groundwater were adequately identified and in accordance with the NSW EPA (2020) reporting guidelines.

8.0 Remediation Criteria

8.1 Soil

The Cardno (2022j) RAP provided the following rationale for selection of the soil remediation criteria for human and ecological receptors based on the ASC NEPM[1]. :

> *As the development areas consist of new building or building alterations within a hospital setting, the HIL-B exposure scenario, residential with minimal opportunities for soil access is considered appropriate given the potential for migration of soil, dust, vapours. For external landscaped areas, the HIL-C open space criteria (more sensitive than HIL-B) should be used. Where specific external areas are to be used for child-care or immuno-suppressed or immuno-compromised persons, more conservative criteria such as HIL-A or less should be considered on the basis of a further review of the construction design and purpose, however,*

[1] NEPC, 1999. National Environment Protection (Assessment of Site Contamination) Measure 1999) as amended, 2013)

based on the information and preliminary architectural plans provided to date, it does not appear that there will be courtyards where potential soil exposure or gardening (i.e. planting of seeds for food) is proposed.

The Cardno (2022j) RAP provided the following human health criteria:

The specific criteria to be used for building footprint areas are summarised below:

- *Health Investigation Level (HIL-B) for 'Residential with minimal opportunities for soil access; includes dwellings with fully and permanently paved yard space such as high-rise buildings and apartments'*
- *Health Screening Level (HSL A&B) for 'Low – high density residential'*

For external landscaped, public open space, or recreational areas:

- *HIL for Public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths (HIL-C).*
- *HSL for Public open space (HSL-C).*

For asbestos:

- *No visible asbestos for surface soils.*
- *HSL-B: for bonded ACM 0.04% w/w*
- *HSL-C: for bonded ACM 0.02% w/w*
- *0.001% w/w for friable asbestos in soil*

The Cardno (2022j) RAP provided the following ecological health criteria:

Within building footprint and roadways:

- *Ecological Screening Levels (ESL) for commercial / industrial, coarse soil, 0-2m.*
- *Ecological Investigation Levels (EIL) for commercial / industrial, aged, NSW setting, high traffic*

Within landscaped areas:

- *Ecological Screening Levels (ESL) for urban residential and public open space, coarse soil, 0-2m.*
- *Ecological Investigation Levels (EIL) for urban residential and public open space, aged, NSW setting, high traffic.*

The Cardno (2022j) RAP also provide the following derived ecological criteria:

Table 5 Derived ecological soil criteria (Table 5-2 Cardno 2022j)

Analytes		EIL or ESL, Urban residential and public open space (mg/kg)	Inputs
Metals	Arsenic	100	▪ pH – 6 (estimated) ▪ Cation Exchange Capacity (CEC) – 10 cmolc/kg (estimated) ▪ Total Organic Carbon (toc) – 0.5% (estimated) ▪ % Clay – 10%
	Copper	160	
	Chromium III	680	
	Lead	1,100	
	Nickel	290	
	Zinc	750	
PAHs	Naphthalene	170	
	Benzo(α)pyrene	ESL = 0.7	
OCPs	DDT	180	

Auditor's Comments

The Auditor generally agrees with the proposed soil remediation criteria and if met will aloow the site to be suitable for the continued land use following remediation and redevelopment.

8.2 Groundwater

The Cardno (2022j) RAP provided the following groundwater criteria.

Table 6 Groundwater criteria (Table 5-3 Cardno 2022j)

Assessed Value	Guideline or Standard	Criteria
Aquatic Ecosystems	ANZG 2018	Fresh 95% ecosystem level of protection default guideline values (DGVs). For bioaccumulative contaminants, the 99% level of protection is adopted.
Primary and Secondary Contact Recreation	ANZG 2018	ANZG 2018 refers NHMRC 2008, Chapter 9, Table 9.3 Criteria is to be taken as the lowest value of the (Health criteria x 10) or the Aesthetic criteria.
Non-use scenarios (Vapour Intrusion)	NEPC 2013, Schedule B1, Table 1A(4)	HSL-A&B for low to high density residential land use, Sand. As with the SAC, due to the sensitive land use the residential criteria are most appropriate
Buildings and structures	Australian Standard 2159-2009 Piling-Design and Installation (AS2159)	Section 6 – Durability Design
Visual amenity	ANZG 2018	ANZG 2018 refers to NHMRC 2008, Chapter 10.

Auditor's Comments

While the Auditor generally agrees with the proposed groundwater criteria, the Cardno (2022j) RAP appears to allow for sampling and analysis for per and poly-fluoroalkyl substances (PFAS) and the results must be assessed against the HEPA (2020) PFAS National Environmental Management Plan Version 2.0 (NEMP).

8.3 Waste

The Cardno (2022j) RAP referenced the NSW EPA (2014) waste guidelines for material that is required to be removed from the site during redevelopment. The following was provided for material to be imported to the site:

> *Be certified as VENM by the supplier in accordance with the informational requirements of NSW EPA; and*

> *Supporting documentation demonstrates that the material satisfies an EPA Resource Recovery Order, or a NSW EPA Special Exemption by application where a current NSW EPA Resource Recovery Order does not exist. The documentation required will include a specification sheet from the supplier showing the type of material imported is approved, and the materials are inspected by the appointed Environmental Consultant.*

> *The site land owner must declare acceptance of the imported material on the basis that the material satisfies all importation and receival requirements. In this regard, it is recommended that:*

- *The documentation is reviewed by a qualified environmental consultant prior to it being accepted; and,*
- *All importation sites should be assessed by the environmental consultant via site visit, sampling and analyses of representative samples from the importation site.*

Auditor's Comments

The Auditor considers the proposed waste criteria for the characterisation of material to be removed from the site are adequate. The Auditor notes that all documentation related to the appropriate and lawful disposal of material must be provided in the validation report. Documentation related to the

importation of all material to the site must also demonstrate that it has been adequately characterised and fit for use at the site and provided in the validation report.

9.0 Previous Investigation and Summary of Results

The Cardno (2022j) RAP provided a summary review of the following previous investigations[2]:

- Cardno, 2022g. Detailed Site Investigation Report, Royal Prince Alfred Hospital, East Campus. Cardno Ref: 80022026_R001_EastCampus_Detailed Site Investigation Rev0. 10 November.
- Cardno, 2022d. Draft Detailed Site Investigation Report, Royal Prince Alfred Hospital East Campus, 80022026_R001_Detailed Site Investigation RevB_DRAFT. 8 August.[3]
- Cardno, 2022c. Remediation Action Plan, Royal Prince Alfred Hospital, 80022026_R004_RPA Undercroft_RAP_Rev0. 14 April.
- Cardno, 2022b. Draft Preliminary Site Investigation Report, Royal Prince Alfred Hospital, East Campus, Job Reference 80022026, Revision A. 3 March.
- Cardno, 2022a. Contamination Assessment Report, Royal Prince Alfred Hospital, 80022026_R002_Undercroft Delineation_Rev0. 23 February.
- Cardno, 2021. Royal Prince Alfred Hospital Stage 1 Redevelopment – Enabling / Early Works – Ref Package 1 – Targeted Soil Contamination Assessment, 80022026-R00180022026-R001:MB_RevB. 10 December.

The Cardno (2022j) RAP provided tables of soil and groundwater exceedences, which are provided in Attachment A (Cardno Tables 3-1 and 3-2)[4]. The following conclusions were reached:

> *Based on the findings of the site investigation phase, it is considered that contaminants relevant to the RAP are as follows:*
>
> > *Eastern Development:*
> >
> > - *Human Health*
> >
> > - Soil: Asbestos (Bonded) and B(α)P-TEQ.
> >
> > - *Ecological*
> >
> > - Soil: Copper, zinc, and B(α)P.
>
> *It is also noted that remediation and construction works must also be considerate of other contaminants detected and/or that may exist given the nature of the site, and unexpected finds that may be discovered during construction. Other contaminants of concern include:*
>
> - *OCP – Traces of OCPs (aldrin and dieldrin) were detected in fill sample HA415 (0.4 mg/kg and 4.8mg/kg, respectively), but concentrations were below the adopted NEPC 2013 Tier 1 human health screening criteria. These detections indicate historic use of pesticides at the site.*
> - *PCB – Substations exist within the area of demolition. Sub soils are to be investigated once demolition works occur.*
> - *Biological waste – Given the nature of the setting (pathology building), the potential for biological waste should be considered.*

The Cardno (2022j) RAP also noted:

> *With regards to the investigation completed within close proximity of the Emergency Bay Area, due to access restrictions (i.e. emergency bay area) the collected samples (BH1(TP301)) were not considered representative of the site target (EBA), and the results*

[2] The discussion in the RAP was presented in the order listed below.
[3] The summary of this report stated that it covered "*the landscaped area east of Royal Prince Alfred Hospital (RPA) loading dock and Gloucester House Plaza (GHP)*".
[4] The Auditor has included the tables from the RevB draft as the formatting is better suited and the table values are identical in the Rev0 final.

are considered to provide background information of the soil quality within close proximity of the EBA. As such, the contaminants relevant to the data gap investigation for this area are as per the CSM.

Auditor's Comments

Of the reports listed above, the Auditor has been provided the Cardno (2022i) DSI and earlier draft versions, which are the subject of AECOM (2022a).

Based on the Auditor's review of the Cardno (2022i) DSI:

- The DSI report was limited to three areas of the proposed redevelopment: (1) the Maternity Ward Parking Area; (2) the East Areas of the RPA East Campus (both comprising the Eastern Development) and (3) the Emergency Bay Area. The scope of the investigation comprised a desktop review of previous investigations and limited intrusive investigations within the Eastern Development Area.
- Based on the results of the investigation, the report concluded that no remediation was required for the Maternity Ward Parking Area. However, due to detections of bonded asbestos, benzo(a)pyrene, metals and organochlorine pesticides exceeding adopted criteria, the report concluded that remediation was required to make the site suitable for the proposed development. A further soil and groundwater sampling program (amongst other recommendations) was recommended to further assess the potential for contamination and address identified data gaps within the Eastern Area and the Emergency Bay Area. The proposed data gap investigation methodology was provided in the Cardno (2022j) RAP (see Section 11.0, below).
- The Auditor's review of the Cardno (2022g) DSI indicated that the report generally complied with the NSW EPA (2020) reporting guidelines, with a number of exceptions as noted in AECOM, 2022a. The key elements lacking clarity centred on the lack of characterisation of contaminants of potential concern (CoPC) within the fill material present on-site. However, the conclusions and recommendations of the report identified the need for additional assessment of data gaps to be incorporated into the RAP. On this basis, the Auditor considers that the Cardno (2022g) DSI was appropriate for the purposes of informing further assessment and development of a remediation strategy.

As noted in the Auditor's review of Cardno (2022f) draft RAP (AECOM, 2022b):

- The Auditor agrees with Cardno regarding the Maternity Ward Parking Area that "*due to the nature of fill ... it should be assumed asbestos may be present in the fill in other areas*". Given the heterogeneity of the fill, this conclusion also applies to the other CoPC including PAHs and some of the metals.
- The Auditor also agrees with Cardno regarding the East Area that "*it should be assumed that it [asbestos] may be present given the nature of fill and historical demolitions that have occurred at this part of the site*". As noted above, given the heterogeneity of the fill, this conclusion also applies to the other CoPC including PAHs and some metals.

The Auditor is of the opinion that based on the results and his experience in conducting contamination investigations and remedial actions in Sydney's inner west over the past 27 years, the fill material underlying the site is heterogeneous and potentially related to former power plant ash placement. Therefore, concentrations of CoPC will be variable across the site and exceedences cannot be considered 'hotspots'.

However, the proposed data gap investigation and addressing the Auditor's comments in AECOM, 2022b, are likely to provide the additional required information to demonstrate site suitability.

10.0 Conceptual Site Model

The Cardno (2022j) RAP provided a Conceptual Site Model (CSM) based on the results of the previous investigations. The Auditor notes that a preliminary CSM was also provide in the Cardno (2022g) DSI. The following provides the Cardno (2022j) RAP CSM. Cardno (2022j) RAP Table 4-1 (*Conceptual Site Model – Eastern Development (Eastern Area of Eastern Campus)*) and Table 4-2 (*Conceptual Site Model – Emergency Bay Area*) are attached and provide the full Source-Pathway-Receptor model.

- Sources
  - Imported fill material potentially used for filling and levelling the or beneath former building slabs.
  - Potential contamination from current and historical land uses – potential boiler ash, poor demolition, use of pesticides, leakage from fuel storage, leakage of fuel, coolants and lubricants used in electrical substations.
  - Low-level fuel leakage from parked vehicles (cars and trucks) both historically and currently on site.
  - Use of corrosive and flammable chemicals such as toluene, kerosene, ethanol, methanol which are chemicals that are associated with the current land use.
  - Hazardous building materials contained in former (demolition rubble) and existing site structures.
  - Weathering of exposed building structures including painted surfaces, metallic objects and cement fibre sheeting (containing lead-based paint and/or asbestos etc.)
- Pathways
  - Direct Contact.
  - Incidental Inhalation (where respirable asbestos fibres become released).
  - Incidental Ingestion.
  - Terrestrial flora and fauna uptake.
  - Leaching to groundwater.
- Receptors
  - Site users.
  - Current and future site workers (including and hospital patients and visitors.
  - Neighbouring site users.
  - Terrestrial based flora and fauna.
  - Aquatic ecosystems.
  - Existing and future plant-based biota within the site.

Auditor's Comments

The Auditor considers that the CSM presented in the Cardno (2022j) RAP was adequate to understand the potential sources, pathways and receptors. While not specifically stated, based on the response to the Auditor's comments in AECOM (2002b), the Auditor understands that construction workers are considered to be "*site workers*" in the CSM. The Auditor notes that construction worker will have more opportunity to come in short-term contact with soils than normal site workers. It is also noted that compliance with the WHS Regulation during redevelopment activities will provide the necessary protection to construction workers.

11.0 Data Gap Investigation

The Cardno (2022j) RAP provided the following discussion of data gaps:

Eastern Development (Maternity Ward Parking Area and East Area of Eastern Campus):

> *The proposed sampling location grid could not be achieved predominantly in the eastern parts of East Area of Eastern Campus due to site access restrictions, multiple buried utilities. As such, characterisation of soil in this part of the site might be incomplete.*

> *Majority of the site surfaces were sealed with either concrete or asphalt pavement, inhibiting the use of test pits thereby limiting observations subsurface soil quality.*

> *Sampling within footprint of Pathology Building (Building 94) and associated sheds, electrical substation, and chapel could not be completed due to access restrictions, height clearance, operational use, thick concrete slabs, and underground services.*

> *Waste classification of soils for offsite disposal is not complete.*

> *The onsite reuse of material remains unknown as volumes of material to be excavated and location of re-use have not been confirmed.*

> *Groundwater flow direction is to be confirmed. Survey data, specifically the surface elevation, for borehole BH201, BH202 and BH303 is to be provided.*

> *Sections of Lambie Dew Drive (to the north and south), part of the existing Whale Garden, and lands within University of Sydney were added to the proposed works area in November 2022 following completion of field investigations documented in this report.*

East Area of Eastern Campus:

> *Soil quality beneath the building footprints are unknown and within the north east corner of the site which is the University of Sydney Land.*

> *Lateral and vertical extent of B(α)P-TEQ human health contamination at borehole location HA413 and HA416 is not fully defined.*

> *Lateral extent of B(α)P-TEQ human health contamination at borehole location HA408 and TP423 is not fully defined.*

> *Lateral and vertical extent of asbestos impact at borehole location HA415 is not fully defined.*

> *Lateral extent of copper ecological contamination at locations BH320 (Cardno, 2022c), BH412 and HA414 is not fully defined.*

> *The lateral extent of zinc ecological contamination at location HA414 is not known.*

> *Desktop, site inspection, and/or intrusive investigation on within University of Sydney lands were not conducted. It is understood that tree removal and new plantings are to form part of construction works within these lands.*

Emergency Bay Area:

> *The environmental quality of soil underlying the EBA is unknown as drilling within the development footprint was not possible due to the current uses of the area which is for hospital patient drop off and covid testing hub. A detailed site walkover is also to be completed once the drop off zone is relocated and the emergency bay can be accessed in a safely manner.*

> *Due to the use of hand auger equipment, soil samples may not be representative of discrete intervals and potential cross contamination of materials such as cave in of asphalt pavement fragments into underlying soils may have occurred.*

> *The sampling method did not enable sufficient sampling volume or observations of fill to assess for the presence of asbestos. This was due to the constrained area, presence of surface pavement, and the relatively small volume of material excavated.*

> *Confirmation of the existence and/or status of reported methylated and white spirit tank(s) identified approximately 100 m south of the site target could not be confirmed.*

> *Groundwater quality and level within the Emergency Bay Area is unknown.*

The Cardno (2022j) RAP allowed for the following data gap investigation that is understood to be conducted "*following hazardous building materials abatement and demolition/removal of building structures as required*" (see attached Figure 3 of Cardno, 2022j for proposed locations):

- A desktop assessment of information for the Sydney University land that would be disturbed.

- Building footprint sampling as follows:
  - A total of 8 locations for Building 94, Building 1 (located to the north of Eastern Area Development), Building 2 (located to the south west of Building 94), and Building 3 (located to the north west of Building 94).
  - A total of 4 locations for the Chapel.
  - A total of 8 locations including 2 groundwater monitoring wells in the Emergency Bay Area.
  - A total of 3 locations at the Whale Garden and Lambie Drew Drive Areas.
  - A total of 3 locations in the Sydney University disturbance area.
  - Allowance for "*at least fifty two (52) primary soil samples to a National Association of Testing Authorities, Australia (NATA) accredited laboratory for analysis of contaminants of concern including PCB, TRH C6 to C40, BTEXN, PAHs, eight metals including As, Cd, Cr, Cu, Hg, Ni, Pb and Zn, and asbestos (per the NEPM 2013 method)*"
  - Allowance for groundwater samples to be analysed for "*TRH C6 to C40, BTEXN, PAHs, eight metals including As, Cd, Cr, Cu, Hg, Ni, Pb and Zn, and total phenols, and VOCs*".

The Cardno (2022j) RAP also stated:

> *Should areas of previously unidentified contamination be encountered during the data gap investigation, the requirement for additional remedial measures shall be assessed. Additionally, this RAP should be revisited following consideration of data and information gathered during the DGI with respect to delineation sampling and further site characterisation in unassessed areas.*

Auditor's Comments

The Auditor considers that the data gap assessment was adequate and identified the data gaps that require to be addressed during the proposed remedial action and successfully documented in a validation report.

With regards to the data gap investigation, the Auditor is of the opinion that OCPs should be added to the analyte list, given the reported concentrations vary by two orders of magnitude. All monitoring wells should be surveyed as soon as practicable following installation.

12.0 Estimated Extent of Remediation

The Cardno (2022j) RAP provided the following table with respect to the estimated extent of remediation.

Table 7 Estimated extent of soil contamination (Table 4-1[5] Cardno 2022j)

Remediation Area	Contaminant	Estimated Depth of Contaminated Material	Preliminary Dimensions of Contaminated Area	Estimated Volume of known contamination	Validation Requirements
Human Health (Area also includes ecological contamination).					
Located within Eastern Area at locations BH408, HA416. (Refer to **Figure 3**)	B(α)P-TEQ	1.5m Fill; Silty Sand, Clayey Sand, Sandy Clay	9 x 6 m = 54 m^2	81m^3	Sample wall and base to confirm removal. Final lateral extent of contamination is not known and validation samples may dictate further excavation requirements.
Located within Eastern Area at locations HA413, TP423 (Refer to **Figure 3**)	B(α)P-TEQ	1.0m Fill; Silty Sand, Clayey Sand, Sandy Clay	Irregular shape 77 m^2	77m^3	Sample wall and base to confirm removal. Final lateral extent of contamination is not known and validation samples may dictate further excavation requirements.
Located within Eastern Area at sample locations HA415 (Refer to **Figure 3**)	Asbestos	0.7m Fill; Silty Sand	2x 2m = 4 m^2	17.5 m^3	Sample wall and base to confirm removal. Final lateral extent of contamination is not known and validation samples may dictate further excavation requirements.
Ecological (Not including soils within the extent of Human Health contaminated soils above).					
Located within Eastern Area at sample location BH320, [Cardno, 2022e]), BH412 and HA414 (Refer to **Figure 4**).	Copper	Average: 0.5m Fill; Silty Sand, Silty Clay	2 x 2 = 4m^2	2 m^3	Sample wall and base to confirm removal. Final lateral extent of contamination is not known and validation samples may dictate further excavation requirements.
Located within Eastern Area at sample location HA414 (Refer to **Figure 4**).	Zinc	0.3m Fill; Silty Sand	2 x 2 = 4 m^2	1.2 m^3	Sample wall and base to confirm removal. Final lateral extent of contamination is not known and validation samples may dictate further excavation requirements.
Located across Eastern Area with the exception of the fill material under the ramp connecting Lambie Drew Drive to the undercroft area of the main RPA building (Refer to **Figure 4**).	B(α)P	1.0m Fill; Silty Sand, Clayey Sand, Sandy Clay, Sandy Silt.	5,255 m^2	5,076 m^3 – *Note: value takes into account the removal of localised contamination noted above*	Sample wall and base to confirm removal.

Auditor's Comments

As noted in AECOM (2022b), the Auditor is of the opinion that given the heterogeneity of the fill material, the data do not support the proposed 'hotspot' excavations. Cardno provided the following response:

[5] The Auditor notes that there were two tables labelled as 4-1 in the Cardno (2020j) RAP and this was the second.

The dimensions provided are preliminary in nature and are provided as a starting point for the remediation. Cardno have taken into account the services that are running within close vicinity of the boreholes with the exceedances, and other infrastructure that is in the way of the locations in order to calculate these preliminary areas.

It is the Auditor's opinion that the data gap investigation and site validation must ultimately demonstrate that the fill has been adequately characterised and is suitable for the land use if a long-term environmental management plan will not be used to passively manage remaining contamination not identified.

13.0 Remediation Options Assessment and Preferred Option

The Cardno (2022j) RAP provided an assessment of potential remediation options, which considered the preferred hierarchy presented in the ASC NEPM. Table 7-2 of the Cardno (2022j) RAP provide the full remediation options assessment and is attached.

The Cardno (2022j) RAP provided the following preferred remediation strategy:

Based on the localised contamination previously identified onsite…, the continued land use as a hospital, and discussion with the Client and Sydney Local Health District, a combination of Option 7 (excavation and offsite disposal) and Option 9 (In-situ encapsulation) are agreed as the preferred options for the human health and ecological contamination to render the site suitable. Where sufficient space is not available to encapsulate excess contaminated soils, these soils will be removed from site as per Option 7.

On-site encapsulation for the contaminants of concern will require a legally enforceable environmental management plan (EMP), however, the level of management is considered to be passive while the encapsulated areas are not disturbed. Routine inspections of the encapsulated areas, and an approval process for any planned disturbances will be required, as will be outlined in the EMP.

Auditor's Comments

The Auditor considers that the remediation options assessment was adequate to identify the preferred remediation strategy. As previously discussed, the Auditor is of the opinion that due to the heterogeneity of the fill material it is likely that a long-term environmental management plan (LTEMP) will be required for remaining fill material, whether encapsulated or not.

14.0 Remediation Methodology

The Cardno (2022j) RAP provided the following sequence for the remedial action:

1. *Preliminaries and site establishment;*
2. *Visual inspection and asbestos clearance inspection of soil surface soils across all areas of Eastern Development area post hardstand removal;*
3. *Investigation of Lambie Dew Drive (north and south extensions); Whale Garden extension; EBA area; and University of Sydney land;*
4. *Eastern Area post-demolition investigation of building(s) footprint soil assessment;*
5. *Remedial excavation of contaminated soils and waste classifications;*
6. *Preparation of encapsulation cells, where required and onsite encapsulation works;*
7. *Validation of remedial excavations following the removal of contaminated materials; and*
8. *Reporting.*

A detailed description of each element was provided.

With regards to on-site encapsulation, the following schematic capping design was provided:

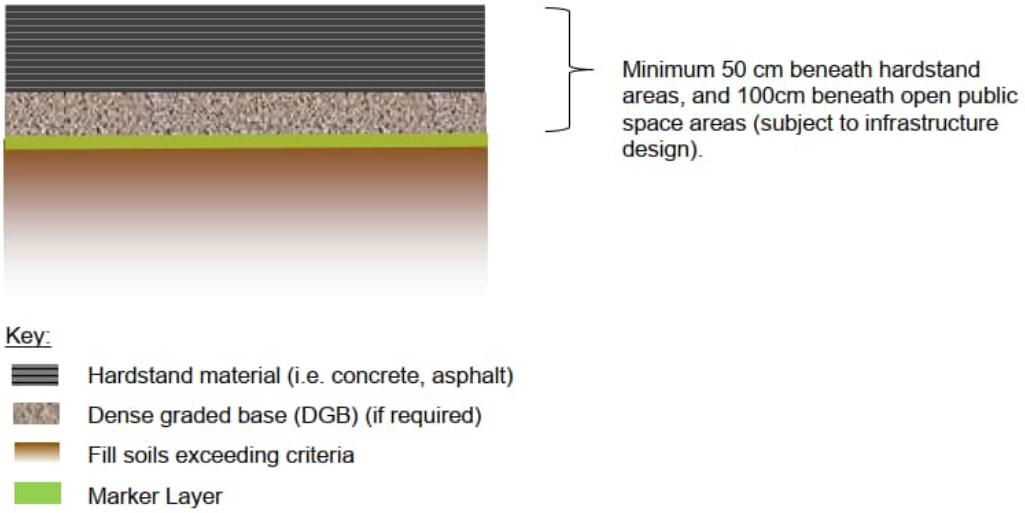


Figure 3 Proposed Schematic of Capping (Cardno, 2022j)

The Cardno (2022j) RAP "*recommended that prior to construction, a design specification is prepared consistent with the clients civil and structural requirements for the proposed encapsulation area. Each element of the design must be validated at construction prior to continuing with construction.*"

Auditor's Comments

The Auditor considers that the provided remediation methodology was adequate to understand the sequencing of events and appropriate hold points and reporting requirements.

The Auditor does however note that there was no rationale was provided for the proposed capping thickness and is of the opinion that final capping thickness should be dependant on the earthworks plan. Regardless, the capping thickness should be a minimum of 100mm plus landscaping.

15.0 Construction Environmental and Waste Management Plan

The Cardno (2022j) RAP provided a Construction Environmental and Waste Management Plan (CEWMP), which detailed:

- Stockpile management
- Waste management and tracking, including removal of asbestos waste
- Excavation water management
- Air, noise and dust management
- Acid sulfate soil management
- An unexpected finds protocol
- Stormwater and sediment management
- Roles and responsibilities

Auditor's Comments

The Auditor considers that the provided methodology for managing the site during remediation activities was adequate and complied with the NSW EPA (2020) reporting guidelines.

16.0 Work Health and Safety Plan

The Cardno (2022j) RAP provided a Work Health and Safety Plan, which included:

- WHS Planning and Preparation
- Incident management (safety and environment)

- Community consultation

Auditor's Comments

The Auditor considers that the provided plan for managing work health and safety at the site during remediation activities was adequate and complied with the NSW EPA (2020) reporting guidelines.

17.0 Validation Plan

The Cardno (2022j) RAP provided the following tables summarising the proposed validation sampling:

Table 8 Soil Validation Sampling Summary (Table 11-1 Cardno, 2022j)

Remediation Area	Sampling Density	Chemical of concern
Area of human health and ecological contaminated soils shown in **Figure 3**, and any other areas identified during future sampling data gap investigations or construction works.	Linear – 1 sampling location per 5m length (asbestos), and 1 sampling location per 10m (chemical) of excavation wall. Vertical –1 sampling location per 0.5m depth of excavation or change in soil horizon. Base – 1 sample location per 25m² (chemical: grid size 5m x 5m, to allow detection of a circular hotspot with a nominal diameter of 6m with 95% certainty). For asbestos validation completed double density (1 sample/12.5m²).	Metals (copper, zinc), PAH, asbestos (quantification)
Existing building footprint	Linear (Building 94, Building 1, Building 2, Building 3): 1 sampling location per 125m², 8 sample locations in total. Linear (Chapel): 1 sampling location per 62.5 m², 4 sample locations in total. Vertical (all buildings) –1 sampling location per 0.5m depth of excavation or change in soil horizon. For asbestos validation completed double density (1 sample/12.5m²).	Metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), TRH, BTEX, PCB, OCP, PAH, VHC, PFAS (selected samples only) and asbestos (quantification), with TCLP testing (as required)
EBA, Lambie Drew Drive, Whale Garden, University of Sydney lands (if validation is required)	Linear – 1 sampling location per 5m length of excavation wall. Vertical –1 sampling location per 0.5m depth of excavation or change in soil horizon. Base – 1 sample location per 25m² (grid size 5m x 5m, to allow detection of a circular hotspot with a nominal diameter of 6m with 95% certainty). For asbestos validation completed double density (1 sample/12.5m²).	Metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), TRH, OCP, BTEX, PCB, PAH, VHC, PFAS (selected samples only) and asbestos (quantification), with TCLP testing (as required)
Stockpile Material	One sample per 25m³ of stockpiled material, up to 250m³. A minimum of three samples is required for any stockpile. For stockpiles >250m³ but <2500 m³ in size, a statistical analysis approach may be used for classification, with the collection of at least 10 samples.	Metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), TRH, BTEX, PAH, OCP, OPP, PCB and asbestos, with TCLP testing (as required) and any additional chemicals that may be identified by the supplementary investigation
Capping soils and imported material	If material is required to be sourced from off-site to reinstate the site, it should be certified suitable for the intended use and should be VENM or a NSW EPA Resource Recovery Order as per NSW EPA Waste Classification Guidelines. If the material does not have suitable certification, then the material should be rejected. Inspection of source sites and sampling at a minimum rate of one per 75 m³ and minimum 3 primary samples to be analysed. The imported material is to be inspected at the site in small batches to confirm that the material conforms to the assessed material at the source site.	

Table 9 Validation Sample Collection (Table 11-2 Cardno, 2022j)

Activity	Details
Soil Sampling	> Soil samples to be collected directly from exposed surface or the excavator bucket using disposable nitrile gloves, and transferred to laboratory provided glass jars and sampling bags. The soil samples are to be collected on the same day as excavation to ensure that contaminants prone to degradation / weathering (such as pathogens, TRH and BTEX) are representative. > Analytical testing of soil samples are to generally target fill materials, however, at least one soil sample is to be collected from the underlying natural soil and may be tested if physical evidence of contamination is noted or if overlying fill is found to be significantly contaminated. > Primary and duplicate soil samples to be submitted to National Association of Testing Authorities, Australia (NATA) accredited laboratory. > Field procedure for asbestos identification in soils to include: Visual assessment at each sample location; if asbestos is identified WA DoH field assessment methodology of soils including collection of 10L soil samples and visual assessment against a coloured tarp for asbestos fragments. This process will be conducted at locations observed to contain adversely impacted fill, and at locations previously identified as being impacted with asbestos.
Sampling Frequency and Laboratory Analysis	As outlined in **Table 11-1**.
Soil Logging	Soils encountered during the investigation to be described and logged in accordance with Australian Standard AS 1726:2017 – Geotechnical site investigations.
Soil sample containers and holding times	> Metals - 250g glass jar / refrigeration 4oC / 6 months (maximum holding period). > TRH/VOCs - 250g glass jar / refrigeration 4oC / 14 days (maximum holding period). > PAH/OCP/OPP/PCB - 250g glass jar / refrigeration 4oC / 14 days (maximum holding period). > Asbestos – up to a 1kg resealable bag and/or 10 litre resealable plastic (polyethylene) container/no refrigeration/indefinite holding time.
Groundwater sample Containers and holding time	> Metals – HDPE preserved with hydrochloric acid (1 mL)/ refrigeration 4oC / 6 months (maximum holding period). > TRH/VOCs – amber vials preserved with hydrochloric acid (1 mL) / refrigeration 4oC / 14 days (maximum holding period). > PAH - Amber glass, acid-washed and solvent rinsed bottles / refrigeration 4oC / 14 days (maximum holding period). > Unpreserved HDPE bottles.
Decontamination Procedure	Reusable sampling equipment such as hand tools (shovel, trowel, mattock), water level metre and micropurge groundwater pump to 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.
Quality Control, Laboratory Analysis and transport	All soil samples are to be submitted for analysis of previously-identified chemicals of concern by a NATA Certified laboratory as outlined in **Section 6**. Field duplicate samples to be collected for QA/QC purposes, by carefully mixing the material and distributing evenly between sampling containers. Quality assurance (QA) and quality control (QC) procedures as outlined in **Section 6** will be adopted throughout the field sampling program to ensure sampling precision and accuracy. QA/QC testing is to also comprise of rinsate blank and trip blank samples. All samples are to be transported under strict Chain-of-Custody (COC) conditions.

Auditor's Comments

The Auditor notes that Cardno provided the following response to AECOM (2022b) regarding validation sampling density rationale:

> *For Area of human health and ecological contaminated soils shown in Figure 3, and any other areas identified during future sampling data gap investigations or construction works - sampling densitities* [sic] *linear walls have been adjusted for chemicals and asbestos. Double density wthin* [sic] *the WADOH (2009) guidelines approach is considered to be appropriate for asbestos.*
>
> *For Existing building footprint - this is based on the NSW EPA minimum sampling guidelines 2022.*

For EBA, Lambie Drew Drive, Whale Garden, University of Sydney lands - given that these areas form part of the Eastern Development overall area, the validation sampling has been determined based on the fact that asbestos will be tested. As such a double density approach is considered to be appropriate.

For Stockpile Material - this is based on the NSW EPA minimum sampling guidelines 2022. Cardno notes that the guidelines indicate to adopt 1 sample/25m3 for volumes up to 75m3, and then 1 sample/75m3 there after if stockpile is not suspected to contain asbestos. However, taking into consideration that the RAP may be followed by personnel that may not be qualified to confirm if asbestos is suspected in a stockpile or not, a conservative approach of 1/25m3 was deemed to be most appropriate.

For capping soils and imported material - on the basis that only VENM, or material that falls under a NSW EPA RRO is permited [sic] *to be imported to site, the sampling density is based on the NSW EPA minimum sampling guidelines 2022. Cardno notes that the guidelines indicate to adopt 1 sample/25m3 for volumes up to 75m3, and then 1 sample/75m3 there after. The 100m3 has been reduced to 75m3.*

The Auditor agrees with the sampling density rationale.

18.0 Contingency Plan

The Cardno (2022j) RAP provided the following contingency plan for the proposed remedial action.

Table 10 Contingency plan (Table 12-1 Cardno (2022j)

Potential Issue	Contingency Measure
Evidence of additional contamination not previously identified	Further assessment involving intrusive investigations or remediation may be required to quantify and delineate potential contamination. The COPC analytical suite may be adjusted based on the nature of the potential source. The Unexpected Finds Protocol (UFP, **Section 9.6**) will be communicated, implemented and followed during the construction phase of the project.
Greater than anticipated volumes of soil require management	The proposed remedial strategy is scalable in that additional soil can be excavated and retained on-site. Off-site soil disposal is scalable for if large, unexpected volumes of soil are produced. In the case of additional contaminated soil being identified and on-site containment is feasible, this may be undertaken subject to approval by the relevant authority.
Unintentional release of stockpiled soil or water drained from stockpile	Construction of appropriate erosion and sedimentation controls around 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. Assess if off-site migrations cause Duty to Report.
Water ingress to excavation is unmanageable	Consider aggressive means to remove the water (multiple vacuum trucks) or below ground dewatering equipment. Consider installation of a physical barrier to block the water ingress.
Elevated COPC concentrations are encountered within remaining soils following remedial excavations	Following the validation sampling of the initial remedial excavations (walls and base), should contamination be identified to remain then additional excavation will be required to chase out the extent of contamination. Further validation sampling will be undertaken. This process will be repeated until soils are suitable to remain onsite.
Imported material is determined unsuitable	If identified prior to entry onto site, material is to be stopped at the site gate and returned to 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 the site must undergo waste classification to allow for appropriate disposal offsite.

The Cardno (2022j) RAP also provided the following triggers for additional management of contamination:

> *Change of the development plan which may involve shallower excavation works, retention of fill soils;*

> *Unexpected finds of contaminated material which are incompatible with the remedial approach;*

> *Finalisation of development plans;*

> *Gross contamination in groundwater at EBA; and*

> *Any modification to NSW environmental or planning legislation affecting the RAP.*

Auditor's Comments

The Auditor considers that the contingency plan and the additional triggers that would lead to further assessment and management provided in the Cardno (2022j) RAP were adequate to allow for the remedial action to allow the site to ultimately be made suitable for the intended use following remediation and validation.

The Auditor notes that the results of the data gap investigation must also feed into the contingency planning if additional contamination is found and requires management.

19.0 Cardno (2022j) RAP Conclusions

The Cardno (2022j) RAP provided the following conclusions:

> *Once all remediation works have been undertaken and the validation works have been completed successfully in accordance with this RAP, then the site would be considered suitable for the land use.*

Auditor's Comments

The Auditor's ISAA conclusions are provided in Section 20.0 below.

20.0 Interim Site Audit Advice Conclusions

Based on the documentation provided for review, as discussed in the ISAA, the Auditor is of the opinion that:

- The site investigation work conducted to date on the Eastern Campus demonstrates that the site is underlain by variable, heterogeneous fill material. The investigations have generally met the NSW EPA (2020) sampling design guidelines.
- The Cardno (2022j) RAP provides an adequate data gap assessment and additional investigation methodology that will allow collection of data to address the data gaps.
- With regards to the estimated extent of remediation, given the variable and heterogeneous of the type of fill material present at the site, it is the Auditor's opinion that the data gap investigation and site validation must ultimately demonstrate that the fill has been adequately characterised and is suitable for the land use.
- The Cardno (2022j) RAP provides an adequate remediation options assessment for the reported concentrations of the CoPC.

The Auditor is of the overall opinion that completion of the data gap investigation and implementation of the RAP (including addressing the Auditor's comments), will allow the site to be made suitable for the proposed redevelopment.

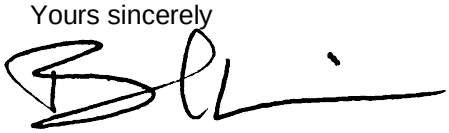
The Auditor notes that adequate documentation demonstrating that the RAP has been implemented and the site successfully validated must be provided following remediation activities. It is also recommended that periodic updates are provided during remediation activities.

21.0 Refences

- AECOM, 2022a. RPA East Campus, Site Audit BE167 Site Audit Memo 01. 19 October.
- AECOM, 2022b. RPA East Campus, Site Audit BE167 Site Audit Memo 02. 7 November.
- Cardno, 2021. Royal Prince Alfred Hospital Stage 1 Redevelopment – Enabling / Early Works – Ref Package 1 – Targeted Soil Contamination Assessment, 80022026-R00180022026-R001:MB_RevB. 10 December.
- Cardno, 2022a. Contamination Assessment Report, Royal Prince Alfred Hospital, 80022026_R002_Undercroft Delineation_Rev0. 23 February.
- Cardno, 2022b. Draft Preliminary Site Investigation Report, Royal Prince Alfred Hospital, East Campus, Job Reference 80022026, Revision A. 3 March.
- Cardno, 2022c. Remediation Action Plan, Royal Prince Alfred Hospital, 80022026_R004_RPA Undercroft_RAP_Rev0. 14 April.
- Cardno, 2022d. Draft Detailed Site Investigation Report, Royal Prince Alfred Hospital East Campus, 80022026_R001_Detailed Site Investigation RevB_DRAFT. 8 August.[6]
- Cardno, 2022e. Detailed Site Investigation Report, Royal Prince Alfred Hospital, East Campus. Cardno Ref: 80022026_R001_EastCampus_Detailed Site Investigation Rev0 dated 5 October 2022
- Cardno, 2022f. Remediation Action Plan, Royal Prince Alfred Hospital. Cardno Ref: 80022026_R004_RPA East Campus_RAP_RevA.docx. 14 October.
- Cardno, 2022g. Detailed Site Investigation Report, Royal Prince Alfred Hospital, East Campus. Cardno Ref: 80022026_R001_EastCampus_Detailed Site Investigation RevB. 4 November
- Cardno, 2022h. Remediation Action Plan, Royal Prince Alfred Hospital. Cardno Ref: 80022026_R004_RPA East Campus_RAP_RevB.docx. 4 November.
- Cardno, 2022i. Detailed Site Investigation Report, Royal Prince Alfred Hospital, East Campus. Cardno Ref: 80022026_R001_EastCampus_Detailed Site Investigation Rev1. 10 November.
- Cardno, 2022j. Remediation Action Plan, Royal Prince Alfred Hospital. Cardno Ref: 80022026_R004_RPA East Campus_RAP_Rev0.docx. 10 November.
- HI, 2022. Royal Prince Alfred Hospital Redevelopment State Significant Development Application Design Report. October.
- NSW EPA, 2014. Waste Classification Guidelines Part 1: Classifying waste. November.
- NSW EPA, 2017. Contaminated Land Management: Guidelines for the NSW Site Auditor Scheme (3rd Edition). October.
- NSW EPA, 2020. NSW EPA Guideline for Consultants Reporting on Contaminated Land. April.
- NSW EPA, 2022. Sampling Design Guidelines, Part 1 and Part 2. August.

[6] The summary of this report stated that it covered "*the landscaped area east of Royal Prince Alfred Hospital (RPA) loading dock and Gloucester House Plaza (GHP)*".

Yours sincerely



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encl: AECOM (2022b) Site Audit Memo
Figures
Tables

AECOM

RPA East Campus, Site Audit BE167

Site Audit Memo No.: BE167_SAM02
Date: 7-Nov-22
Site inspection date: N/A

Response to Site Audit Memo No.: BE167_SAM02
Date of response: 10/11/2022
Response prepared by: Cardno now Stantec - Darren Hanvey and Alejandra Beltran

Purpose of Memo: To provide review and comments on documentation provided and compliance with NSW EPA approved guidelines, including the NSW EPA (2020) reporting guidelines.

Background to Site Audit: This Site Audit Memo (SAM) has been prepared as interim advice for the RPA East Campus Site Audit. The Auditor is Mr Brad Eismen of AECOM Australia Pty Ltd (AECOM), accreditation number 0102.

Reference(s): This SAM presents the Auditor's review of the following documentation:
Cardno, 2022. Remediation Action Plan, Royal Prince Alfred Hospital. Cardno Ref: 80022026_R004_RPA East Campus_RAP_RevB.docx. 4 November.

Other documentation considered in this SAM:
AECOM, 2022. Site Audit Memo BE167_SAM01. 19 October
Cardno, 2022. Detailed Site Investigation Report, Royal Prince Alfred Hospital, East Campus. Cardno Ref: 80022026_R001_EastCampus_Detailed Site Investigation Rev0. 5 October.
Cardno, 2022. Detailed Site Investigation Report, Royal Prince Alfred Hospital, East Campus. Cardno Ref: 80022026_R001_EastCampus_Detailed Site Investigation RevB. 4 November
Cardno, 2022. Remediation Action Plan, Royal Prince Alfred Hospital. Cardno Ref: 80022026_R004_RPA East Campus_RAP_RevA.docx. 14 October.
Various drawings from the RPA-ARC-BSA-DRG-DA drawing set (RPA-ARC-BSA-DRG-MW-DA0001, RPA-ARC-BSA-DRG-MW-DA0102, RPA-ARC-BSA-DRG-MW-DA0103, RPA-ARC-BSA-DRG-MW-DA0104, RPA-ARC-BSA-DRG-MW-DA0901, RPA-ARC-BSA-DRG-MW-DA0902, RPA-ARC-BSA-DRG-MW-DA1001, RPA-ARC-BSA-DRG-MW-DA1002)
HI, 2022. Royal Prince Alfred Hospital Redevelopment State Significant Development Application Design Report. October.

Consistent with NSW EPA requirements for staged "sign-off" of sites that are the subject of progressive assessment, remediation and validation, the Auditor is required to advise that:
This site audit advice does not constitute a site audit report or statement.
This interim advice is considered by the Auditor to be consistent with NSW EPA guidelines and policies.
This interim advice will be documented in the final Site Audit Statement and associated documentation.
At the completion of the site audit, a Site Audit Statement will be prepared, for the consent agency to include the Site's property information, held by the local council.

The comments provided herein are not necessarily exhaustive or final and the Auditor may have additional comments/questions/requirements based on the responses and/or additional information provided or more detailed reviews.

Item No	Document Reference	Auditor's Comments	Consultant's Response (Cardno now Stantec)	Auditor's Response (11- Nov-2022)
1	General	As noted in BE167_SAM01, the Auditor can only certify land use in the areas investigated and remediated, not the entirety of Lot 1000 DP 1159799. It is understood that the certification may extend into the adjacent Sydney University land where tree removal and landscaping will occur.	Noted. Cardno is in agreeance with this statement. Cardno are unaware if the University of Sydney lands are to be acquired or leased, and who if required, would be responsible to implement management of these lands.	The area that is to be disturbed and/or remediated and/or validated will be subject to this site audit. Therefore, the Auditor requires a survey plan showing the subject audit area, which clearly defines all lot and DP numbers and the size of the disturbed area.
2	Executive Summary and Section 1.1	Please confirm the reference to the Cardno 2022 DSI. The 4 November 2022 version provided to the Auditor was defined as RevB in the document history table.	That is correct. RevB is the DSI dated 4/11/2022.	Closed

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3	Section 1.2, Figure 2 and Figure 4	The area of the East Area of the Eastern Development (formerly Area B) is stated to be approximately 3,550m^2, which does not appear to be correct based on a quick estimation using SIXMAPS (see screenshot below), and appears to be at least twice the size. Please confirm. The Auditor also notes that Drawing *11/02/22_ IA0251300- SK-SK-2001* included in the RevB DSI shows the "*TOTAL AREA*" as 9,995 m^2, which appears to include the Maternity Ward Parking Area (formerly Area A) and the Emergency Bay Area (not previously included). What implications does the larger disturbance area have on the sampling density in the DSI and validating larger areas, such as where trees will be removed, which are presumably in the heterogeneous fill material? 	The area of the East Area of the Eastern Development (formerly Area B) is approximately 6,758m2. This is based on the GIS measurements which used the architectural plans provided by the client. Please refer to Figure 2 of Appendix A. As outlined in the DSI (RevB) and the RAP, Eastern development now includes the fomer Area B and Area A (the Maternity Ward area), which as per the architectural plans, has a total combined area of 8,803 m2. All areas are clearly outlined in Table 2-1. The Total Area of 9,995m2, as outlined in the Drawing 11/02/22_ IA0251300- SK-SK-2001, is referring to Maternity ward, former Area B which is now referred to eastern area of East Campus and the Emergency Bay Area. The number of investigation locations (33) to date is more than sufficient to meet the sampling design guidelines for a site area of 8,803 m2 (i.e. 20 number of investigation locations required). However, Cardno recommends that additional investigation locations are completed as part of data gap investigation as the three areas of site expansion are located near site boundaries and are not small (i.e. northern extension of Lambie Dew Drive, extension onto Whale Garden, extension into University of Sydney Lands, and southern extension of Lambie Dew Drive). It was also considered that investigation near the Whale Garden and northern extnsion of Lambie Dew Drive (i.e. BH407, shallow terminated on buried concrete slab) was insufficient. These additional investigation locations are shown in RAP, Figure 3, Appendix A. A snapshot of this figure is provided to the right of this cell for ease of reference. Given that the Emergency Bay area is not within close vicinity of the Eastern Development, Cardno considered the EBA to be a separate area to the Eastern Development. As such, the data gap investigation in the EBA is independant from the Eastern Development.	See response to Item No 1.
4	Section 1.4	The scope of work indicates that the site history is to be defined, however not summary of the site history is provided in the document. Please update to include.	The scope of work (first bullet point) has been changed from : "Define..." to "Summarise...". A summary of the site history has been provided in Section 3.2.	This section is new and was not in RevB.
5	Section 1.4	The Auditor notes that a conceptual site model was initially developed in the DSI.	Noted. The CSM is included as a requirement of the CROCL (Consultants Reporting on Contamianted Land, EPA 2020) for a RAP document.	Closed
6	Sections 1.5, 3.1.5, 13.1.2 and 13.1.3	Reference to SEPP 55 is no longer valid and is now incorporated into the State Environmental Planning Policy (Resilience and Hazards) 2021.	SEPP55 reference removed from Sections 1.5, 13.1.2, 13.1.3. It has not been removed under Section 3.1.5 as the section is a summary from previous report and that was the conclusion made in the previous report.	Closed - the Auditor if of the opinion that currency should override cut-and-paste.
7	Section 1.5	Please provide a copy of all referenced HI documents.	These have been provided as separate files.	Closed
8	Section 1.6	Will the environmental consultant be engaged by the client or contractor? When will this be determined?	These questions are to be directed to the Client.	Noted
9	Table 2-1	The Auditor notes that the site address (for Lot 1000) is also 12 Missenden Rd.	Noted.	Closed
10	Table 2-1	The Auditor understands that a portion of Sydney University land will form part of the disturbed area and therefore part of this site audit. Therefore Table 2-1 needs to reflect all appropriate land identifiers.	Formal details on Lot and DP of University of Sydney where provided post completion of RAP. These details have been updated in Table 2-1.	Closed
11	Table 2-1	See previous comment on East Area size - Table 2-1 provides an area of 8,803m2 for the entire Eastern Development. Former Area A does not appear to be larger than former Area B.	The information provided in the table has been misinterpreted. Please refer to details column of Table 2-1 which outlines that for this report Eastern Development refers to " East area of Eastern Campus and Maternity Ward Parking Area current land use and total area, including University of Sydney landscaping lands.", and as such the total area for the Eastern Development is 8,803m2.	See response to Item No 1.
12	Table 2-3	As noted in BE167_SAM01, the groundwater monitoring wells require surveying as a matter of urgency so that the groundwater flow direction can be confirmed.	Noted. This will be completed in the upcoming fieldworks. Cardno notes that this can be addressed post submission of SSDA and before works start.	Noted. The Auditor will provide further discussing in the ISAA.
13	Section 3.1	Please provide full copies of all referenced reports not previously provided to the Auditor, including geotechnical reports, if available.	TSA to provide to the Auditor.	Noted
14	Section 3.1.1	Please confirm the reference to the 3 November 2022, Cardno DSI. Is this the same as the 4 November 2022 RevB document provided to the Auditor?	Yes it is. This has been amended.	Closed
15	Section 3.1.1	The Auditor requires confirmation of the status of the USTs, as well as actual locations on a scaled plan.	Status of the USTs infront of Victoria Pavillion cannot be confirmed as the area is currently blocked off by scaffolding. As outlined in the report the SafeWork searches do not provide details on the exact locations. The records indicate that the tanks are located infront of Victoria Pavillion. This has been added in Figure 2. The diesel tank within the loading dock area is an active tank. Cardno have requested records to be provided by HI regarding the tank but we have been advised that the records cannot be found.	The Auditor notes that this information must be updated and included in the validation report.

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16	Section 3.1.1	What is the likely source of the B(a)P?	The B(a)P was detected in Fill soils. The origin of the Fill soils or processes it may have been exposed to are unknown so a positive identification of the source of B(a)P in the Fill soils is not possible. It is noted however, that during sampling potential slag and ash materials were observed in the fill at various depths and locations.	Noted. The Auditor will provide further discussing in the ISAA.
17	Section 3.1.1 - Maternity Ward Parking Area	The Auditor agrees that "*due to the nature of fill ... it should be assumed asbestos may be present in the fill in other areas*". Given the heterogeneity of the fill, this conclusion also applies to the other CoPC including PAHs and some of the metals.	The fill in the Maternity Ward Parking Area (former Area A) was consistently below adopted criteria from a chemical perspective (apart from one location TP403). It has been recommended that an additional investigation location should be undertaken in the Whale Garden extension. A broad suite of contaminants will be investigated. The comment was specific to asbestos and the potential nature of historc demolitions and fill, however; as part of the RAP we have recommended for testing to be done for all CoPC during waste classification.	Closed, provided all CoPC are analysed for during the additional investigation. Needs to address land use suitably for fill that will remain.
18	Section 3.1.1 - Maternity Ward Parking Area	Given the heterogeneity of the fill material, the Auditor requires additional justification for adequate site characterisation given, "*the fill thickness was not fully penetrated across all borehole locations due to buried slabs, sampling method (hand auger) and safety issues (test pit depth >3mBGL)*". Will the area be included in the long-term EMP?	The soils within the maternity ward had no exceedances within the depth of construction and investigation which indicated that the fill soil was of acceptable quality for the proposed development which will involve soil disturbance of up to 1.5mBGL only. Area won't be included in EMP, however, additional investigation location has been receommended due to an expansion of works within the Whale Garden.	While the proposed disturbance may only be 1.5 metres below ground surface, the fill material still requires characterisation, given the Auditor is signing off on the land use, not the redevelopment activities. Therefore, the Auditor requires sampling on the full thickness of the fill, especially the fill that will remain.
19	Section 3.1.1 - Maternity Ward Parking Area	The fourth bullet point is essentially repeated in the final bullet point and can be deleted. The final bullet point references the additional testing required and is therefore more appropriate.	This has been modified. A friendly reminder that this section is a summary of previous reports. Doubling up on conclusions makes no difference to the message the report is conveying.	Noted and closed
20	Section 3.1.1 - East Area of Eastern Campus	Given the heterogeneity of the fill material, the Auditor requires additional justification for adequate site characterisation given, "*the fill thickness was not fully penetrated across all borehole locations due to buried concrete slabs, and sampling method (hand auger)*".	The fill material has been extensively tested across accessible sites and Cardno has used other means to assist with the characterisation of the soil, these include PID readings, visual assessments and focusing on the areas of highest contamination risk. Cardno has indicated that further testing is required in order to further characterise the fill material and natural material.	Closed, provided all CoPC are analysed for during the additional investigation. Needs to address land use suitably for fill that will remain.
21	Section 3.1.1 - East Area of Eastern Campus	The Auditor agrees that "*it should be assumed that it* [asbestos] *may be present given the nature of fill and historical demolitions that have occurred at this part of the site*". Given the heterogeneity of the fill, this conclusion also applies to the other CoPC including PAHs and some metals.	The comment was specific to asbestos and the potential nature of historic demolitions and fill, however; as part of the RAP we have recommended for testing to be done for all CoPC during waste classification and CoC for validation.	Closed, provided all CoPC are analysed for during the additional investigation. Needs to address land use suitably for fill that will remain.
22	Section 3.1.1 - East Area of Eastern Campus	Figure 5 shows the single location in the Emergency Bay Area. There is no Figure 3 in the RAP provided for review and Figure 5 was duplicated.	Figure 3 is now attached.	Closed
23	Section 3.1.1 - East Area of Eastern Campus	Please provide more information on how 4.8 mg/kg of Dieldrin is considered a "*trace*", when the reported concentration was 2 orders of magnitude greater than the LOR.	The word trace is making reference to the concentration in relation to human health risk, as such it is considered trace as the concentrations present a low risk for human health.	The Auditor does not agree. This will be discussed in the ISAA. OCPs will be analysed for in the additional investigation.
24	Section 3.1.1 - East Area of Eastern Campus	The ninth bullet point is essentially repeated in the final bullet point and can be deleted.	This has been modified. A friendly reminder that this section is a summary of previous reports. Doubling up on conclusions makes no difference to the message the report is conveying.	Noted and closed
25	Section 3.1.1 - Emergency Bay Area	The Auditor agrees that additional investigation is required to adequately characterise the Emergency Bay Area.	Noted.	Closed
26	Section 3.1.1 - Groundwater	But copper, nickel and zinc were also reported in the fill material. Where would the copper come from in the local geological profile?	During the most recent GME round 16/9/2022, copper was detected at concentrations of 1.0ug/l (BH201), 2.0ug/l (BH202) and <1ug/L (BH303). The fresh water criteria is 1.4ug/l. BH202 was only slighty in exceedance of this criteria, whilst the others were below the criteria. Given the low levels of detection, the measure concentrations are all considered to be associated with natural background in the siltstone. None of these concentrations are considered to pose risk to the closest aquatic ecosystem. Copper in fill soil, was found to have low leachable potential based on ASLP and Kd calculations.	While the reported concentrations may not be considered a risk, they are not likely naturally occurring and therefore could be variable over time.

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27	Section 3.1.5	Please reference the correct clause in SEPP (Resilience and Hazards) 2021.	It has not been removed under Section 3.1.5 as the section is a summary from previous report and that was the conclusion made in the previous report.	Closed - the Auditor if of the opinion that currency should override cut-and-paste.
28	Section 3.2	As noted in BE167_SAM01 and above, the heterogeneous nature of the fill material must be considered when interpreting individual location results.	Noted. Refer to previous comments.	Noted. The Auditor will provide further discussing in the ISAA.
29	Table 3-1	Human health for lead states, "*Based on statistical analysis completed during the Cardno (2022a) investigation, human health contamination is considered to be of concern for the site. As such remediation is not required.*" If lead is considered to be of concern, wouldn't some for of remediation or management be required?	The sentence has been corrected as follows: "Based on statistical analysis completed during the Cardno (2022a) investigation, human health lead contamination is **not** considered to be of concern for the site. As such remediation is not required."	Closed
30	Table 3-2	See previous comment on naturally occurring copper.	During the most recent GME round 16/9/2022, copper was detected at concentrations of 1.0ug/l (BH201), 2.0ug/l (BH202) and <1ug/L (BH303). The fresh water criteria is 1.4ug/l. BH202 was only slighty in exceedance of this criteria, whilst the others were below the criteria. Given the low levels of detection, the measure concentrations are all considered to be associated with natural background in the siltstone. None of these concentrations are considered to pose risk to the closest aquatic ecosystem. Copper in fill soil, was found to have low leachable potential based on ASLP and Kd calculations.	See response to Item No 26.
31	Section 3.2	While the Auditor agrees that "*the potential for biological waste should be considered*", how will it be managed? There is no additional information in the RAP.	No visual observations of biological waste have been made thus far in any intrusive investigations. Biological waste findings, if any, are to be generally managed in accordance with the Unexpected Finds Protocol and Local Health District Waste Mangement Plan. A sub-section has been added to the Unexpected Finds Protocol for Biological Waste finds. Clinical and related wastes discovered within soil (as buried) may be deemed an incident and may be subject to other legislative requirements regarding who must be informed if there is an incident. Cardno considers that the highest risk area for potentially encountering this sort of contaminant are buildings currently and historically associated with pathology and clinical waste management. Mainly due to the type of activities that have been completed there.	Closed
32	Section 3.2	When and by whom are the substation soils to be investigated/validated? Doesn't management of this need to be part of this RAP?	The substation soils will be investigated and managed post demolition and will form part of the data gap analysis. This is as per Section 8.	Closed
33	Section 3.2	Same comment for biological waste.	As above.	Closed
34	Section 4.1	As per the previous comments, there is no mention of biological or medical waste. Also, given reported concentrations of volatile halogenated compounds (VHCs) in the West Campus, what is the justification for not considering VHCs?	TRH, BTEX and VHC have been added to the final row of Table 4-1 Conceptual Site Model – Eastern Development (Eastern Area of Eastern Campus). These and PFAS will be assessed during the data gap investigation for building footprints.	Closed
35	Section 4.1.1 and Tables 4-1 and 4-3	What about construction workers and visitors during redevelopment?	Construction workers fall under "site workers" category, and visitors also fall under "site users" category. Table has been left as is.	Noted. The Auditor will provide further discussing in the ISAA.
36	Section 4.3	There is no figure labelled Figure 3 with the RAP provided for review.	Figure 3 in now attached.	Closed
37	Table 4-1 in Section 4-3	Please provide the rationale for determination of the contamination area dimensions.	The dimensions provided are preliminary in nature and are provided as a starting point for the remediation. Cardno have taken into account the services that are running within close vicinity of the boreholes with the exceedances, and other infrastructure that is in the way of the locations in order to calculate these preliminary areas.	Noted. The Auditor will provide further discussing in the ISAA.
38	Table 4-1 in Section 4-3	Given the heterogeneity of the fill material, the Auditor is of the opinion that the data do not support the proposed 'hotspot' excavations. For example, using the sample design guidelines and assuming a 2 x 2 'hotspot' size to be determined, 309 samples would be required across a 3,550m^2 area to support a 2 x 2 hotspot. The Auditor does not consider this practical.	Cardno have provided preliminary areas for remediation. These are preliminary and are not definitive mainly due to the fact that there is an accessibility issue in completing delineation sampling and it would be unreasonable to consider the entire site as being impacted with asbestos or carcinogenic PAHs as there are sufficient samples with no contamination.	Noted. The Auditor will provide further discussing in the ISAA. Ultimately the data gap investigation and site validation must demonstrate that the fill has been adequately characterised and is suitable for the land use.
39	Section 5.1	Given the heterogeneity of the fill material and statements like "*due to the nature of fill ... it should be assumed asbestos may be present in the fill in other areas*", the Auditor does not consider that the contamination can be considered "*localised*".	The word localised has been removed.	Closed
40	Table 5-1	Reference to, "*child-care or immuno-suppressed or immuno-compromised persons, more conservative criteria such as HIL-A or less should be considered on the basis of a further review of the construction design and purpose, however, this has not been evaluated for this investigation*" either needs to be addressed or closed out in the RAP and not left as a data gap.	This has been closed out in Table 5-1.as follows: As the development areas consist of new building or building alterations within a hospital setting, the HIL-B exposure scenario, residential with minimal opportunities for soil access is considered appropriate given the potential for migration of soil, dust, vapours. For external landscaped areas, the HIL-C open space criteria (more sensitive than HIL-B) should be used. Where specific external areas are to be used for child-care or immuno-suppressed or immuno-compromised persons, more conservative criteria such as HIL-A or less should be considered on the basis of a further review of the construction design and purpose, however, based on the information and preliminary architectural plans provided to date, it does not appear that there will be courtyards where potential soil exposure or gardening (i.e. planting of seeds for food) is proposed. Note: Criteria may need to be reviewed once final detailed design is completed and provided.	Noted.
41	Section 5.4	Will the groundwater assessment criteria also be used as remediation criteria, if necessary?	If necessary, groundwater remediation criteria will be confirmed.	Closed

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42	Table 6-1	Given the heterogeneity of the fill material, the vertical boundary should include the depth of fill and not limited to ≤1mBGL.	Table 6-1 has been updated to note that the vertical limit is from existing ground surface, underlying fill and natural soil horizons to the base of contaminated soil. Validation criteria has been updated accordingly.	Closed
43	Section 8.1.1	When will the Soil Excavation, Encapsulation, and Disposal Management Plan be developed. The Auditor requires review of this plan, which should really be part of the RAP.	The plan will be develop once the civil plans are developed and finalised. The civil plans will provide a more definitive idea on the volume of soil that will be excavated and where it would be most appropriate to have the encapsulation area. It is understood that Civil Plans will not be provided in the SSDA.	Noted
44	Section 8.1.3.2	See previous comment on missing Figure 3. Where are the locations for building footprints and the University of Sydney area shown?	Figure 3 in now attached.	Closed
45	Section 8.1.3.2	The Auditor considers that the data gap investigation results should also be included in the validation report.	Noted. This requirement has been added under Section 8.1.3.2.	Closed
46	Section 8.1.3.3	Given the reported concentrations of OCPs, please provide justification for not including in the list of analytes.	OCPs have been added. Note: OCPs does form part as the analytical suite for waste classification purposes.	Noted. Results are to be used for additional site characterisation purposes.
47	Section 8.1.3.4	Please include a survey of the wells to determine groundwater flow direction. The survey must be comparable to that conducted on the existing wells, which should be completed as soon as practicable.	The groundwater wells will be surveyed in the upcoming weeks when other works in the Western Campus are completed.	Noted
48	Section 8.1.5	What is the rationale for the 50mm to 100mm minimum capping?	Section 8.1.5 has been updated, the capping thickness were incorrect and should have been cm not mm.	Noted, however there is no rationale provided for the proposed thicknesses regardless whether mm or cm.
49	Section 8.1.6.2	All reports must be in accordance with the NSW EPA (2020) reporting guidelines.	Noted. A comment regarding this has been added for clarity.	Closed
50	A review of Sections 9 and 10 will be provided under separate cover		Site Auditor to provide.	
51	Section 11	Is Building B93 being demolished, and if not, how with the footprint be assessed/validated?	No, building 93 (Centenary Building) which is the building to the north of Pathology Building (Building 94) will not be demolished. Building 93 is outside the extent of works footprint. For the buildings that will be demolished, an assesment plan is outlined under the data gap assessment section, Section 8.1.3.	Closed
52	Section 11	General question related to new planting in remaining heterogeneous fill - will this be covered in a landscape management plan?	It is understood that all plantings will be subject to a landscape plan. Cardno have not been provided with this.The landscaped areas within University of Syndey grounds as shown in Figures 2 and 3, will be covered under the data gap investigation - Section 8.1.3.	Noted
53	Section 11.1 and Table 12-1	The Auditor is of the opinion that the fill material could be capped in place with a passive long-term EMP depending on the bulk earthworks plan. Chasing fill material that exceeds the soil validation criteria, and not required for bulk earthworks, could end up with large disposal volumes.	The bulk earthworks plan have not been finalised by the Client and have not been issued to Cardno. As such the areas where material is suitable for capping cannot be determined at this stage. It is understood that the review of the bulk plans and proper encapsulation areas will be outlined post the SSDA submission which is when the bulk earthworks plans are expected to be finalised.	Note. Please provide the finalised earthworks plans when available.
54	Table 11-1	Given the heterogeneity of the fill material and likely sources, please include lead for the "*area of human health and ecological contaminated soils*".	Lead was not determined to be a contaminant of concern on the basis of soil analyses to date. It has been added on the basis that there are data gaps in the soil investigation.	Closed
55	Table 11-1	Please provide the rationale for the proposed sampling densities.	For Area of human health and ecological contaminated soils shown in Figure 3, and any other areas identified during future sampling data gap investigations or construction works - sampling densitities linear walls have been adjusted for chemicals and asbestos. Double density wthin the WADOH (2009) guidelines approach is considered to be appropriate for asbestos. For Existing building footprint - this is based on the NSW EPA minimum sampling guidelines 2022. For EBA, Lambie Drew Drive, Whale Garden, University of Sydney lands - given that these areas form part of the Eastern Development overall area, the validation sampling has been determined based on the fact that asbestos will be tested. As such a double density approach is considered to be appropriate. For Stockpile Material - this is based on the NSW EPA minimum sampling guidelines 2022. Cardno notes that the guidelines indicate to adopt 1 sample/25m3 for volumes up to 75m3, and then 1 sample/75m3 there after if stockpile is not suspected to contain asbestos. However, taking into consideration that the RAP may be followed by personnel that may not be qualified to confirm if asbestos is suspected in a stockpile or not, a conservative approach of 1/25m3 was deemed to be most appropriate. For capping soils and imported material - on the basis that only VENM, or material that falls under a NSW EPA RRO is permited to be imported to site, the sampling density is based on the NSW EPA minimum sampling guidelines 2022. Cardno notes that the guidelines indicate to adopt 1 sample/25m3 for volumes up to 75m3, and then 1 sample/75m3 there after. The 100m3 has been reduced to 75m3.	Closed
56	Table 11-1	Given the reported concentrations of OCPs, please provide justification for not including in the list of analytes for the remediation areas.	OCPs have been added for the data gap investigation.	Closed
57	Table 11-2	What are the unpreserved HDPE bottles for?	The unpreserved HDPE bottles can be used for testing of physicochemical characteristics of groundwater if required.	Closed
58	Table 11-2	Decon 90 has reportedly contained PFAS and should not be used for decontamination of sampling equipment.	PFAS is not a contaminant of concern and does not form part of the CSM model as such Decon 90, which is more easily accessible has been recommended.	PFAS is an analyte and if Decon 90 is used then Cardno will need to demonstrate that it is PFAS free.

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59	Section 14	Please confirm the reference to the Cardno 2022 DSI. The 4 November 2022 version provided to the Auditor was defined as RevB in the document history table.	RevB corresponds to the DSI report dated 4 November 2022.	Closed
60	Section 15	Please include references to all reports discussed in the RAP.	This has been added. Though the reports are already referenced in Section 3.	Closed
61	Section 15	What is the reference to "*Standards Australia (2005)*" at the end of the NEPM reference?	"Standards Australia (2005)" has been removed.	Closed
62	Figures	Please provide a copy of Figure 3 (not included). As noted above, Figure 5 was provided twice. The Auditor requires a figure in the RAP that shows the entire area that will be disturbed during redevelopment.	Figure 3 in now attached. Please refer to comment 3 above. A bulk excavation plan has not yet been provided by the Client. Please refer to Figure 2, showing extent of works and architectural plan provided by the client which is under Appendix A.	Closed
63	Figure 4	Please confirm the discrepancy between the sample location labels and those described in the tables. It appears that some are labelled as TP in the figure and BH in the tables. If this is the case, please provide a table showing which TPs and the same BH.	It is noted that the borehole sample was collected as BH01, but given that the borehole was done in conjunction with the geotechnical report, the geotech team labelled the borehole as TP301. As such for consistency across figures from geotech report and environmental report, the label TP301 was adopted. This is outlined under section 3.3, we have presented BH1 and in brackets have TP301 thus indicating they are the same borehole.	Noted. The Auditor will provide further discussing in the ISAA.

NSW GOVERNMENT Health Infrastructure

Site Location Plan

ROYAL PRINCE ALFRED HOSPITAL

Legend

- East Campus Boundary
- Eastern Development - East Area of Eastern Campus
- Eastern Development - Maternity Ward Parking Area
- Emergency Bay Area
- Suburb Boundary (LPI, 2011)
- Cadastre (NSW SS, 2022)

Camperdown Location

FIGURE 1

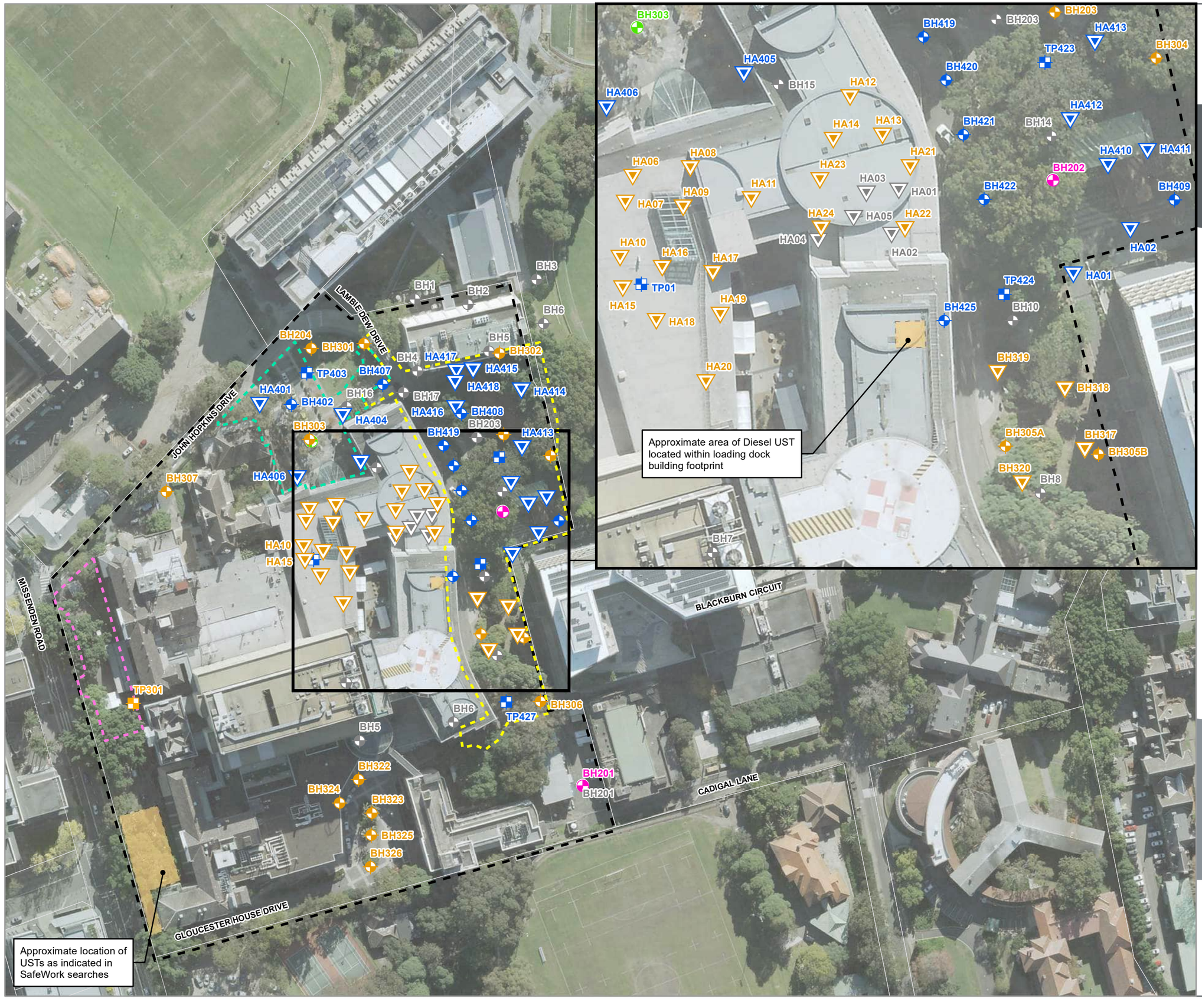
1:8,500 Scale at A3

m
0 100 200 300 400

N

Cardno now Stantec

Map Produced by Stantec Australia Pty Ltd (3048)
Date: 2022-11-03 | Project: 80022026
Coordinate System: GDA2020 MGA Zone 56
Map: 80022026-GS-001-SiteLocationPlan.mxd 03
Aerial imagery supplied by MetroMap (June, 202)



NSW GOVERNMENT Health Infrastructure

Eastern Campus Sampling Location Plan

ROYAL PRINCE ALFRED HOSPITAL, CAMPERDOWN

Legend

- Test Pit (Cardno, 2022)
- Test Pit (Cardno, 2021)
- Test Pit (Sydney Environmental Group, 2022)
- Groundwater Well (Cardno, 2021)
- Groundwater Well (Douglas Partners, 2020)
- Eastern Development - East Area of Eastern Campus
- Eastern Development - Maternity Ward Parking Area
- Emergency Bay Area
- Site Boundary
- USTs
- Cadastre (NSW SS, 2022)
- Borehole (Cardno, 2022)
- Hand Auger (Cardno, 2022)
- Borehole (Cardno, 2021-2022)
- Hand Auger (Cardno, 2021)
- Borehole (Douglas Partners, 1989 / 1998)
- Hand Auger (Douglas Partners, 1989 / 1998)

FIGURE 2

1:1,500 Scale at A3

m
0 20 40 60 80

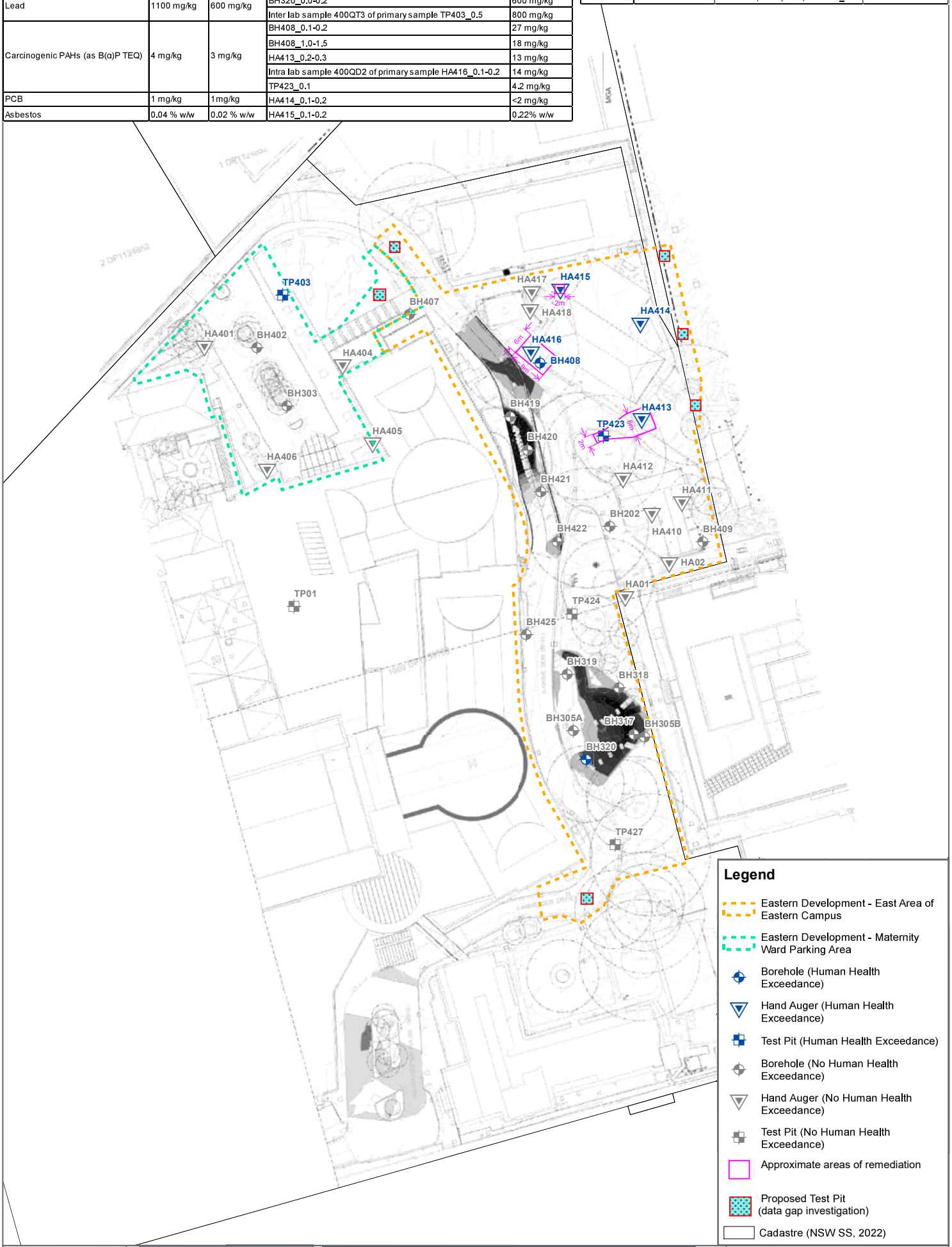
N

Cardno now Stantec

Map Produced by Stantec Australia Pty Ltd (3048)
Date: 2022-11-10 | Project: 80022026
Coordinate System: GDA2020 MGA Zone 56
Map: 80022026-GS-029-EastCampus_SamplingPlan.mxd 01
Aerial imagery supplied by Metromap (July, 2021)

East Area of Eastern Campus Human Health Exceedances				
Contaminant	**HIL B Criteria**	**HIL C Criteria**	**Sample ID**	**Concentration**
Lead	1100 mg/kg	600 mg/kg	BH320_0.0-0.2	600 mg/kg
			Inter lab sample 400QT3 of primary sample TP403_0.5	800 mg/kg
Carcinogenic PAHs (as B(α)P TEQ)	4 mg/kg	3 mg/kg	BH408_0.1-0.2	27 mg/kg
			BH408_1.0-1.5	18 mg/kg
			HA413_0.2-0.3	13 mg/kg
			Intra lab sample 400QD2 of primary sample HA416_0.1-0.2	14 mg/kg
			TP423_0.1	4.2 mg/kg
PCB	1 mg/kg	1mg/kg	HA414_0.1-0.2	<2 mg/kg
Asbestos	0.04 % w/w	0.02 % w/w	HA415_0.1-0.2	0.22% w/w

Maternity Ward Parking Area Human Health Exceedances			
Contaminant	**HIL C Criteria mg/kg**	**Sample ID**	**Concentration mg/kg**
Lead	600	400QT3 of primary sample TP403_0.5	800



NSW Health Infrastructure

FIGURE 3

1:850 Scale at A3

m 0 10 20 30

Human Health Exceedance Plan

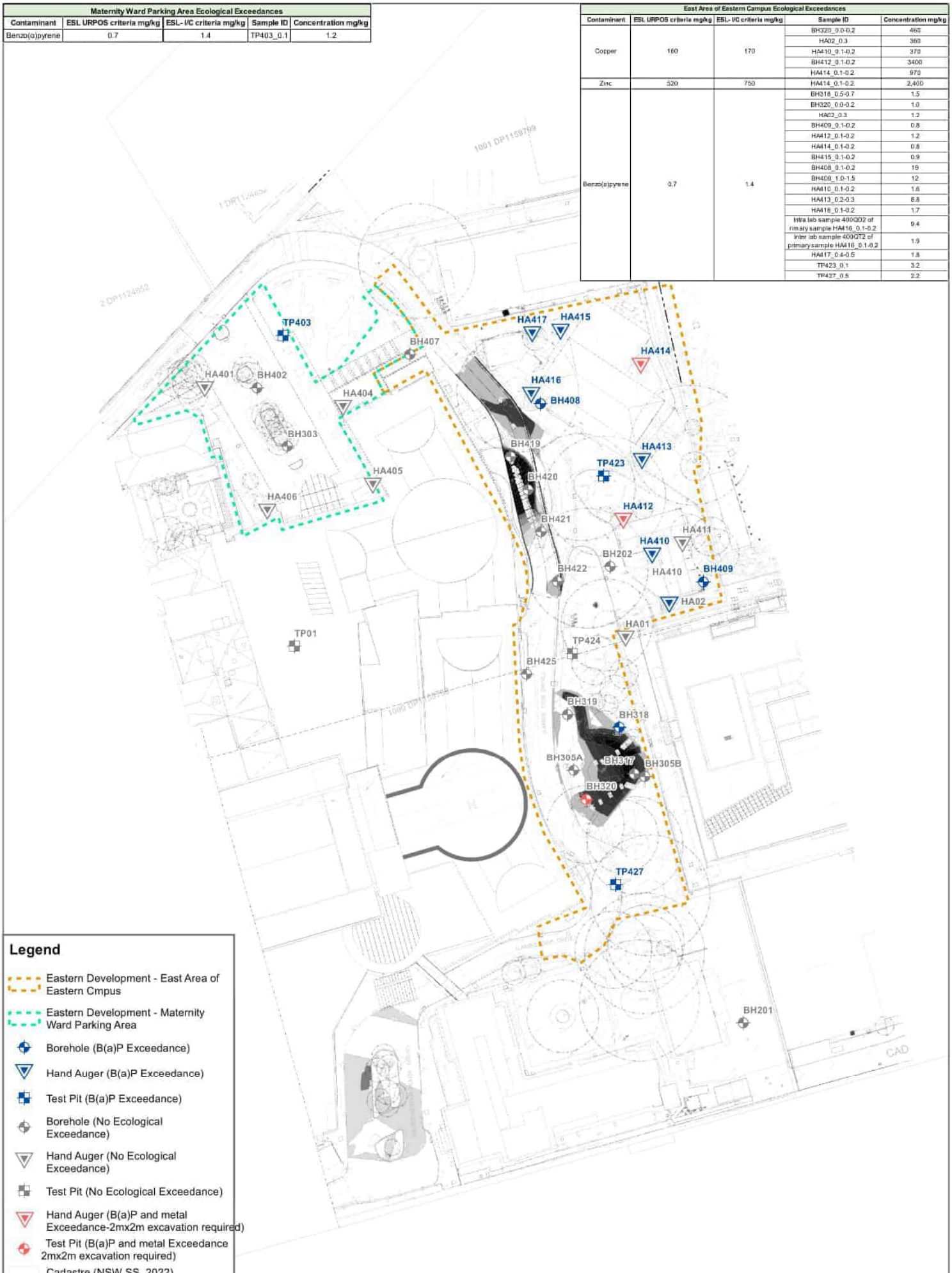
ROYAL PRINCE ALFRED HOSPITAL, CAMPERDOWN

Cardno now Stantec

Map Produced by Stantec Australia Pty Ltd (3048)
Date: 2022-11-03 | Project: 80022026
Coordinate System: GDA2020 MGA Zone 56
Map: 80022026-GS-026-HumanHealth.mxd 01

Maternity Ward Parking Area Ecological Exceedances				
Contaminant	ESL URPOS criteria mg/kg	ESL- I/C criteria mg/kg	Sample ID	Concentration mg/kg
Benzo(a)pyrene	0.7	1.4	TP403_0.1	1.2

East Area of Eastern Campus Ecological Exceedances				
Contaminant	ESL URPOS criteria mg/kg	ESL- I/C criteria mg/kg	Sample ID	Concentration mg/kg
Copper	180	170	BH320_0.0-0.2	460
			HA02_0.3	360
			HA410_0.1-0.2	370
			BH412_0.1-0.2	3400
			HA414_0.1-0.2	970
Zinc	520	750	HA414_0.1-0.2	2,400
Benzo(a)pyrene	0.7	1.4	BH318_0.5-0.7	1.5
			BH320_0.0-0.2	1.0
			HA02_0.3	1.2
			BH409_0.1-0.2	0.8
			HA412_0.1-0.2	1.2
			HA414_0.1-0.2	0.8
			BH415_0.1-0.2	0.9
			BH408_0.1-0.2	19
			BH408_1.0-1.5	12
			HA410_0.1-0.2	1.6
			HA413_0.2-0.3	8.8
			HA416_0.1-0.2	1.7
			Intra lab sample 400Q02 of rimary sample HA416_0.1-0.2	9.4
			Inter lab sample 400QT2 of primary sample HA416_0.1-0.2	1.9
			HA417_0.4-0.5	1.8
			TP423_0.1	3.2
			TP427_0.5	2.2



Legend

- Eastern Development - East Area of Eastern Cmpus
- Eastern Development - Maternity Ward Parking Area
- Borehole (B(a)P Exceedance)
- Hand Auger (B(a)P Exceedance)
- Test Pit (B(a)P Exceedance)
- Borehole (No Ecological Exceedance)
- Hand Auger (No Ecological Exceedance)
- Test Pit (No Ecological Exceedance)
- Hand Auger (B(a)P and metal Exceedance-2mx2m excavation required)
- Test Pit (B(a)P and metal Exceedance 2mx2m excavation required)
- Cadastre (NSW SS, 2022)

NSW Government Health Infrastructure

FIGURE 4

1:850 Scale at A3

m 0 10 20 30

Ecological Exceedance Plan

ROYAL PRINCE ALFRED HOSPITAL, CAMPERDOWN

Cardno now Stantec

Map Produced by Stantec Australia Pty Ltd (3048)
Date: 2022-11-03 | Project: 80022026
Coordinate System: GDA2020 MGA Zone 56
Map: 80322026-GS-027-EcologicalExceedance.mxd 01

Emergency Bay Area Human Health Exceedances				
Contaminant	**HIL B Criteria**	**HIL C Cirteria**	**Sample ID**	**Concentration**
Carcinogenic PAHs (as B(α)P TEQ)	4 mg/kg	3 mg/kg	BH1(TP301)_0.5-0.6	150 mg/kg
Total PAH	400 mg/kg	300 mg/kg	BH1(TP301)_0.5-0.6	1,300 mg/kg
Contaminant	**HSL A & B Criteria**		**Sample ID**	**Concentration**
Naphthalene	3 mgkg		BH1(TP301)_0.5-0.6	6.9 mg/kg
TRH F2	110 mgkg		BH1(TP301)_0.5-0.6	230 mg/kg

Emergency Bay Area Ecological Exceedances				
Contaminant	**ESL URPOS criteria mg/kg**	**ESL- I/C criteria mg/kg**	**Sample ID**	**Concentration mg/kg**
Benzo(α)pyrene	0.7	1.4	TP403_0.1	1.2
TRH F2	-	170	BH1(TP301)_0.5-0.6	230
TRH F3	1,300	2,500	BH1(TP301)_0.5-0.6	5,600

NSW Health Infrastructure

FIGURE 5

1:500 Scale at A3

m

0 5 10 15

Emergency Bay Area Exceedances

ROYAL PRINCE ALFRED HOSPITAL, CAMPERDOWN

Cardno now Stantec

Map Produced by Stantec Australia Pty Ltd (3048)
Date: 2022-11-03 | Project: 80022026
Coordinate System: GDA2020 MGA Zone 56
Map: 80022026-GS-028-EmergencyExceedances.mxd 01

TOTAL AREA: 9995m²

PROFESSOR
MARIE BASHIR CENTRE

BRODIE STREET

ANATOMICAL PATHOLOGY

ANSTO RESEARCH CYCLOTRON FACILITY

PBU

KING GEORGE V PARKING

KING GEORGE V BUILDING

SUSAN STREET

RPA SURGICAL & ROBOTIC TRAINING INSTITUTE

SALISBURY ROAD

RADIATION ONCOLOGY DEPARTMENT

CHRIS O'BRIEN LIFEHOUSE

ST JOHNS COLLEGE

MISSENDEN ROAD

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KERRY PACKER
EDUCATION
CENTRE

NORTHEN ENTRY

LAMBIE DERRYBRY

CENTENARY INSTITUTE

NEW EAST

VERTICAL EXTENSION ABOUT CSB

EAST EXTENSION

CLINICAL SERVICES BUILDING

H

SUSAN WAKIL CENTRE SYDNEY UNI

ALBERT PAVILION

ADMINISTRATION BUILDING / ADMISSION BLOCK

EDINBURGH
BUILDING

VICTORIA PAVILION

PATHOLOGY / LABORATORY SERVICES

GLOUCESTER HOUSE

GLOUCESTER HOUSE DRIVE

SBA
(RPAH)

SBA
(USYD)

CADIGAL LANE

N 6248765.190
E 332015.762

N 6248763.112
E 332015.172

N 6248743.543
E 332006.952

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E 332012.462

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E 332096.512

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E 332101.662

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E 332074.405

N 6248674.645
E 331904.086

N 6248654.339
E 331888.998

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E 331893.832

N 6248648.475
E 331894.896

N 6248628.729
E 331900.473

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E 331897.228

N 6248616.868
E 331899.455

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E 332072.343

N 6248595.389
E 332066.520

1 : 500 at A1

EXTENT OF WORKS DIAGRAM

Jacobs
BATESSMART
NEESON MURCUTT + NEILLE
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NSW GOVERNMENT Health Infrastructure

DATE	REVISION DESCRIPTION

11/02/22_ IA0251300- SK-SK-2001

ROYAL PRINCE ALFRED HOSPITAL REDEVELOPMENT STAGE 1

N

Autodesk Docs://RaJ IA0251700-RPA Hospital/IA251300-MAIN.rvt
03/11/2022 09:29:30

Table 3-1 Summary of Identified Soil Exceedances

Analyte	Human Health Criteria (mg/kg)	Human Health Exceedance Sample ID (concentration)	Ecological Criteria (mg/kg)	Ecological Exceedance Sample ID (concentration)	Comments
Eastern Development: East Area of Eastern Campus					
Copper	Not applicable	Not applicable	UR: 120 Ind: 160	▪ HA02_0.3 (360 mg/kg); ▪ BH320_0.0-0.2 (460 mg/kg); ▪ HA410_0.1-0.2 (370 mg/kg); ▪ BH412_0.1-0.2 (3,400 mg/kg); and ▪ HA414_0.1-0.2 (970 mg/kg).	**Ecological:** Based on statistical analysis completed during the Cardno (2022a) investigation, the ecological contamination is considered to be localised to undefined areas represented by BH320_0-0.2 (460 mg/kg, [Cardno, 2022e]) and samples BH412_0.1-0.2 (3,400 mg/kg) and HA414_0.1-0.2 (970 mg/kg). As such, there are ecological limitations on the use of this soil refer to **Section 3.3**.
Lead	HIL C: 600mg/kg	BH320_0.0-0.2 (730 mg/kg)	Not applicable	Not applicable	**Human Health:** Based on statistical analysis completed during the Cardno (2022a) investigation, human health contamination is considered to be of concern for the site. As such remediation is not required.
Zinc	Not applicable	Not applicable	UR: 520 Ind: 750	▪ HA414_0.1-0.2 (2,400 mg/kg)	**Ecological:** Based on statistical analysis completed during the Cardno (2022a) investigation, the ecological contamination is considered to be localised to undefined areas represented by sample at HA414_0.1-0.2. As such, there are ecological limitations on the use of this soil refer to **Section 3.3**.

Analyte	Human Health Criteria (mg/kg)	Human Health Exceedance Sample ID (concentration)	Ecological Criteria (mg/kg)	Ecological Exceedance Sample ID (concentration)	Comments
Benzo(α)pyrene	Not Applicable	Not applicable	UR: 0.7 Ind: 1.4	The following samples exceeded ESL-URPOS (0.7 mg/kg) criteria: ▪ HA02_0.3 (1.2 mg/kg); ▪ BH320_0.0-0.2 (1.0 mg/kg); ▪ BH409_0.1-0.2 (0.8 mg/kg); ▪ HA412_0.1-0.2 (1.2 mg/kg); ▪ HA414_0.1-0.2 (0.8 mg/kg); and ▪ BH415_0.1-0.2 (0.9 mg/kg). The following samples exceeded ESL-URPOS (0.7 mg/kg) and ESL- I/C (1.4 mg/kg) criteria: ▪ BH318_0.5-0.7 (1.5 mg/kg); ▪ BH408_0.1-0.2 (19 mg/kg); ▪ BH408_1.0-1.5 (12 mg/kg); ▪ HA410_0.1-0.2 (1.6 mg/kg); ▪ HA413_0.2-0.3 (8.8 mg/kg); ▪ HA416_0.1-0.2 (1.7 mg/kg); ▪ Intra lab sample 400QD2 of primary sample HA416_0.1-0.2 (9.4 mg/kg); ▪ Inter lab sample 400QT2 of primary sample HA416_0.1-0.2 (1.9 mg/kg); ▪ HA417_0.4-0.5 (1.8 mg/kg); ▪ TP423_0.1(3.2 mg/kg); and ▪ TP427_0.5 (2.2 mg/kg).	**Ecological:** Based on statistical analysis completed during the Cardno (2022a) investigation, the ecological contamination was confirmed. As such, there are ecological limitations on the use of this soil refer to **Section 3.3**.
B(α)P TEQ	HIL B: 4 HIL C: 3	▪ BH408_0.1-0.2 (27 mg/kg); ▪ BH408_1.0-1.5 (18 mg/kg); ▪ HA413_0.2-0.3 (13 mg/kg); ▪ Intra lab sample 400QD2 of primary sample HA416_0.1-0.2 (14 mg/kg); and	Not Applicable	Not applicable	**Human Health:** Based on statistical analysis completed during the Cardno (2022a) investigation, human health contamination is considered to be localised to undefined areas represented by samples at BH408, HA413, and HA416. As such **remediation is required**.

Analyte	Human Health Criteria (mg/kg)	Human Health Exceedance Sample ID (concentration)	Ecological Criteria (mg/kg)	Ecological Exceedance Sample ID (concentration)	Comments
		▪ TP423_0.1(4.2 mg/kg).			
Asbestos	HIL B: 0.04% w/w HIL C: 0.02% w/w	HA415_0.1-0.2 0.22% w/w).	Not Applicable	Not Applicable	**Human Health:** Asbestos was identified at concentrations exceeding human health criteria and as such **remediation is required.**
Emergency Bay Area					
Naphthalene	HSL A&B: 3mg/kg	BH1(TP301)_0.5-0.6 (6.9 mg/kg)	Not Applicable	Not Applicable	The samples collected south of the EBA indicated that the soil is contaminated by PAHs and petroleum hydrocarbons (F2, F3). However, given the locality and depth (ground surface elevation difference of about 4m) of the sample, it is not considered to be representative of the soil material underlaying EBA development footprint. The information obtained within the vicinity of the EBA provides background information on the soil quality across different areas of the RPA site. Given the limitations of the investigation completed within close proximity of the EBA, it is considered that a detailed site investigation is warranted for the EBA and is to be carried out once an alternative location for the ambulance drop off area is assigned.
Benzo(α)pyrene	Not Applicable	Not applicable	UR: 0.7 Ind: 1.4	▪ BH1(TP301)_0.5-0.6 (100 mg/kg); and ▪ BH1(TP301)_1.3-1.4 (1.9 mg/kg).	
B(α)P TEQ	HIL B: 4 HIL C: 3	BH1(TP301)_0.5-0.6 (150 mg/kg)	Not Applicable	Not applicable	
Total PAH	HIL B: 400 HIL C: 300	BH1(TP301)_0.5-0.6 (1,300 mg/kg)	Not Applicable	Not applicable	
TRH F2	HSL A&B: 110 mg/kg	BH1(TP301)_0.5-0.6 (230 mg/kg)	Ind: 170	BH1(TP301)_0.5-0.6 (230 mg/kg)	
TRH F3	Not Applicable	Not applicable	UR: 1,300 Ind: 2,500	BH1(TP301)_0.5-0.6 (5,600mg/kg)	

Note:

UR: Ecological Urban/Residential and Public Open Space Criteria.

Ind: Ecological Commercial/Industrial Criteria.

Table 3-2 Summary of Identified Groundwater Exceedances

Analyte	Criteria (µg/L)	Exceedance Sample ID (concentration)	Comment
Copper	AE-Fresh = 1.4[1]	▪ GWBH202-2 (2 µg/L)	The results of laboratory metals (copper, nickel and zinc) analyses were considered to be attributable to naturally occurring concentrations in the local geological profile. As such, remediation is not required.
Nickel	AE-Fresh= 8[1]	▪ GWBH303-2 (15 µg/L); ▪ GWBH201-2 (24 µg/L); ▪ GWBH202-2 (50 µg/L); ▪ Intra and inter laboratory samples GWQD2-2 (21 µg/L) and GWQT2-2 (23 µg/L) of primary sample GWBH201-2.	
Zinc	AE-Fresh = 8[1]	▪ GWBH201-2 (17 µg/L); ▪ GWBH202-2 (36 µg/L); ▪ GWBH303-2 (24 µg/L); and ▪ Intra and inter laboratory samples GWQD2-2 (17 µg/L) and GWQT2-2 (15 µg/L) of primary sample GWBH201-2.	

Note:

1 – Protection of Aquatic Ecosystems, Marine, 95% Level of Protection

2 – Recreational Water Criteria

Table 4-1 Conceptual Site Model – Eastern Development (Eastern Area of Eastern Campus)

Contaminant Source	Impacted Media	Contaminants of Potential Concern	Potential Exposure Pathways	Receptors	Likelihood of Complete Exposure Pathway
▪ Imported fill material ▪ Fuel storage for backup generator ▪ Low-level leakage from parked vehicles ▪ Historical Site Use: potential for boiler ash, poor demolition ▪ Weathering of exposed building structures containing Hazardous Building Materials	Fill soils within upper 0.5-1.5 mBGL	**Human Health** Actual CoPC detected: ▪ Asbestos (Bonded) ▪ B(α)P-TEQ	▪ Direct Contact ▪ Incidental Inhalation (where respirable asbestos fibres become released) ▪ Incidental Ingestion	**Human Health:** ▪ Site users ▪ Site workers (including maintenance workers) ▪ Neighbouring site users	**Low to medium:** Asbestos was found on ground surfaces and within soil and can be susceptible to degradation causing release of fibres thereby increasing exposure risks to site users and workers. B(α)P-TEQ was found in shallow soils and may be related to the degraded asphalt and /or the contaminant sources noted. Exposure may be increased to site users during dust generation and worker access to soils.
		Ecological Actual CoPC detected: ▪ Copper ▪ Zinc ▪ B(α)P	▪ Terrestrial flora and fauna uptake ▪ Leaching to groundwater	**Ecological:** ▪ Terrestrial based flora and fauna ▪ Aquatic ecosystems	**Medium to high:** Actual CoPCs were detected in soil including exposed soil surfaces, where terrestrial flora and fauna are exposed. Actual consequence to flora and fauna has not been investigated. Complete exposure pathway to aquatic ecosystems is considered to be low given the >1km distance to the inferred groundwater discharge receiving water body.
Hazardous building materials contained within former and existing site structures	▪ Air ▪ Surficial Soils	Potential CoPC: ▪ Asbestos ▪ Lead ▪ PCB ▪ Synthetic mineral fibres	▪ Direct Contact ▪ Incidental Inhalation ▪ Incidental Ingestion	**Human Health:** ▪ Site users ▪ Site workers (including maintenance workers) ▪ Neighbouring site users **Ecological:** ▪ Terrestrial based flora and fauna ▪ Aquatic environmental organisms	**Low to medium:** The building infrastructure is aged and containing hazardous materials in all buildings (Refer to Hazardous Building Material surveys completed by SEG). Post demolition, soils surfaces in surrounding areas may become impacted and should be subject to both clearance inspections and validation sampling and analysis events.
▪ Leakage of coolants and lubricants used in electrical substations ▪ Imported fill material	Soils	Potential CoPC: ▪ Metals ▪ PAH ▪ OCP ▪ PCB	▪ Direct Contact ▪ Incidental Inhalation (where respirable asbestos fibres become released)	**Human Health:** ▪ Site users ▪ Site workers (including maintenance workers) ▪ Neighbouring site users	**Low:** Other CoPCs (i.e. OCPs) were detected below adopted human health and ecological criteria, and given the presence of site infrastructure, access to soils for investigation purposes was inhibited in many areas. As such, other contaminants

Contaminant Source	Impacted Media	Contaminants of Potential Concern	Potential Exposure Pathways	Receptors	Likelihood of Complete Exposure Pathway
▪ Leakage of fuel storage for backup generator ▪ Use of pesticides ▪ Low-level leakage from parked vehicles ▪ Historical Site Use: potential for boiler ash, poor demolition ▪ Use of corrosive and flammable chemicals such as toluene, kerosene, ethanol, methanol ▪ Weathering of exposed building structures containing Hazardous Building Materials		▪ Asbestos ▪ Biological ▪ TRH ▪ BTEX Volatile halogenated compounds (VHC)	▪ Incidental Ingestion	**Ecological:** ▪ Terrestrial based flora and fauna ▪ Aquatic environmental organisms	may be discovered during site constructions works and should continue to be considered during construction.

Table 4-2 Conceptual Site Model – Emergency Bay Area

Contaminant Source	Impacted Media	Contaminants of Potential Concern	Potential Exposure Pathways	Receptors	Likelihood of Complete Exposure Pathway
Imported fill material Fuel storage for backup generator Use of pesticides Low-level leakage from parked vehicles Historical Site Use: potential for boiler ash, poor demolition	Surficial soils	▪ Metals ▪ TRH ▪ PAH ▪ BTEX ▪ OCP ▪ OPP ▪ PCB ▪ Asbestos	▪ Direct Contact ▪ Incidental Inhalation ▪ Incidental Ingestion	**Human:** ▪ Current site users ▪ Future Site workers (including maintenance workers ▪ Neighbouring site users (including neighbouring basement users) **Ecological:** ▪ Existing and future plant-based biota within the site	**Medium to high:** The soil within the EBA has not been characterised and as such the soil quality is unknown.
Historical Site Use Potential for medical waste, boiler ash, poor demolition, and underground storage tank containing methylated and white spirits located 100m south of EBA Use of corrosive and flammable chemicals such as toluene, kerosene, ethanol, methanol	▪ Soils at depth ▪ Groundwater	▪ TRH ▪ BTEX ▪ PAH ▪ Metals ▪ Phenols ▪ Volatile Organic Compounds	▪ Incidental Inhalation ▪ Incidental Ingestion		**Medium to high:** The soil and groundwater within the EBA has not been characterised and as such the soil and groundwater quality is unknown.
Weathering of exposed building structures Hazardous building materials contained within former and existing site structures	▪ Air ▪ Surficial Soils	▪ Asbestos ▪ Lead ▪ PCB ▪ Synthetic mineral fibres	▪ Direct Contact ▪ Incidental Inhalation ▪ Incidental Ingestion		**Low to medium:** There are limited amount of structures (emergency bay canopy and guard shed) within the Emergency Bay Area. Given the age of the guard shed which based on the DSI (Cardno, 2022a) it was erected circa 1982, there is a medium to high probability of the existing shed containing hazardous material within the building fabrics.

Table 7-2 Remediation Options Evaluation

Option	Description	Advantages	Disadvantages	Outcome
1	Do Nothing	▪ Elimination of remedial costs.	▪ Contaminated media has been identified at the site that must be addressed to minimize potential risks to human health and/or the environment; and ▪ Does not address the RGs listed in **Section 5**, and as such the land would remain unsuitable for the proposed use.	Considered unsuitable.
2	Monitored Natural Attenuation	▪ Elimination of remedial costs.	▪ The identified COPCs are not amenable to concentration reduction through natural processes in a timely manner; and ▪ Does not address the remediation goals listed in **Section 5**, and as such the land would remain unsuitable for the proposed use.	Considered unsuitable.
3	On-site Immobilisation Fixation/Stabilisation and re-use on-site	▪ Technology has shown to be reliable at immobilising the identified COPCs; ▪ The COPCs are amenable to stabilisation; ▪ Moderate cost; ▪ The operation and management costs are low, with minimal long-term monitoring once CoPCs are stabilised; and ▪ No significant WHS requirements.	▪ Some limitations with fully mixing the stabilisation reagent in media with a range of grain sizes; ▪ Requires excavation of the material with potential vegetation clearance; ▪ Would require segregation from growing mediums; ▪ Would require an Environmental Management Plan (EMP) for long-term monitoring and protection of the remediated soil. ▪ Would require bench-scale study requiring long time period to determine if methods employed are validated.	Considered unsuitable.
4	On-site Soil Washing and re-use on-site	▪ The material requiring remediation has varying grain sizes.	▪ Soil washing will not remove asbestos or waste materials (boiler ash); ▪ Would require bench-scale study. ▪ May require multi-stage process. ▪ Would require construction of a secure soil wash containment area. ▪ Would require liquid waste disposal and soil validation process.	Considered unsuitable.
5	Off-site Immobilisation Fixation/Stabilisation and re-use either on-site or off-site	▪ Technology has shown to be reliable at immobilising the identified CoPCs; ▪ The CoPCs are amenable to stabilisation; ▪ Would be completed at an appropriate facility. ▪ The operation and management costs are low, with minimal long-term	▪ May require bench-scale study. ▪ Requires certainty from an EPA licenced treatment facility; ▪ Greater cost than Option 3 due to transportation and facility treatment costs. ▪ Requires substantial more testing to validate soils for re-use once treated. ▪ Requires waste treatment documentation to be complete.	Considered unsuitable.

Option	Description	Advantages	Disadvantages	Outcome
		maintenance once CoPCs are stabilised; and ▪ No significant WHS requirements.		
6	Off-site Soil Washing and re-use on-site or off-site	▪ The material requiring remediation has varying grain sizes. ▪ Would be completed at an appropriate facility.	▪ Soil washing will not remove asbestos or waste materials (boiler ash); and ▪ Requires certainty from an EPA licenced treatment facility; ▪ Would require bench-scale study. ▪ May require multi-stage process. ▪ Requires substantial more testing to validate soils for re-use once treated. ▪ Would require liquid waste disposal. ▪ Requires waste treatment documentation to be complete.	Considered unsuitable.
7	Excavation and Offsite Disposal at Landfill	▪ Relatively easy to implement and proven solution; ▪ Minimises potential risks to human health and environment; ▪ Sustainable long-term remediation option; ▪ Low ongoing operation and maintenance; ▪ Economically viable for smaller, localised areas of contamination with soils classified as general solid waste; and ▪ Removes liability for ongoing management.	▪ Costs of offsite disposal at a licenced facility; ▪ Costs to import soil for construction purposes (if required); ▪ Uses up landfill space; ▪ Higher energy expenditure and costs to transport off-site ▪ Requires waste documentation to be complete.	**Considered suitable**.
8	Above-ground consolidation and encapsulation	▪ Ease of implementation at the site; ▪ Reliable option at removing human health and ecological receptor pathways; ▪ The open space at the site could accommodate landscaped mounds or embankments; ▪ Moderate costs; ▪ The ongoing operation and maintenance have low costs as it requires minimal long-term monitoring; and ▪ Relatively sustainable.	▪ Contamination is not reduced, only isolated; ▪ Ongoing management required via legally enforceable Environmental Management Plan (EMP); ▪ Additional engineering of containment within final design and construction; ▪ Requires separate civil/landscaping/engineering design to locate and accommodate the volume of soil to be encapsulated; ▪ Not well understood at private individual scale and may hinder buyers.	Considered unsuitable.

Option	Description	Advantages	Disadvantages	Outcome
9	In-situ Encapsulation	▪ Easy implementation at site; ▪ Amenable to both asbestos and B(α)P-TEQ. ▪ Reliable option at removing human health and ecological receptor pathways; ▪ Moderate costs if used in conjunction with above-ground consolidation; ▪ The ongoing operation and maintenance have low costs as it requires minimal long-term monitoring; and ▪ Sustainable option.	▪ Contamination is not reduced, only isolated; ▪ Where applicable ongoing management required via legally enforceable Environmental Management Plan (EMP); ▪ Requires separate civil/landscaping/engineering design to locate and accommodate the volume of soil to be encapsulated; ▪ Although excavation may not be required for soils in some areas, ground treatments will be required (i.e. lateral confinement, marker layers); ▪ Not well understood at private individual scale and may hinder buyers.	**Considered suitable**.

			BTEX							TPH					CRC Care TPH Fractions							
			Naphthalene (VOC)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	Total BTEX	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)	C6-C10	C10-C16	C16-C34 (F3)	C34-C40 (F4)	TRH C37-C40	C10 - C40 (Sum of total)	F1: C6-C10 less BTEX	F2: >C10-C16 less Naphthalene
			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
LOR			0.1	0.1	0.1	0.1	0.2	0.1	0.3	0.6	20	20	45	45	50	20	25	90	100	100	100	20	25
NEPM 2013 EIL Comm./Ind., low pH, CEC, clay content - fresh																							
0-2m																							
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - fresh																							
0-2m																							
NSW 2014 General Solid Waste CT1 (No Leaching)				10	288	600			1000		650				10000								
NSW 2014 General Solid Waste SCC1 (with leached)				18	518	1080			1800		650|6500				10000								
NSW 2014 Restricted Solid Waste CT2 (No Leaching)				40	1152	2400			4000		2600				40000								
NSW 2014 Restricted Solid Waste SCC2 (with leached)				72	2073	4320			7200		2600				40000								
PFAS NEMP 2.0 Table 2 Health Industrial/Commercial (HIL C)																							
PFAS NEMP 2.0 Table 2 Health Residential min soil access (HIL B)																							
PFAS NEMP 2.0 Table 3 Ecological Direct Exposure - All Land Uses																							
PFAS NEMP 2.0 Table 3 Ecological Indirect Exposure - All Land Uses																							
NEPM 2013 ESL Comm./Ind., Fine Soil																							
0-2m				95	135	185			95			170[#4]						2500	6600			215	170
NEPM 2013 ESL UR/POS, Fine Soil																							
0-2m				65	105	125			45			120[#4]					120	1300	5600			180	
NEPM 2013 HIL, Commercial/Industrial D																							
NEPM 2013 HIL, Recreational C																							
NEPM 2013 HIL, Residential B																							
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																							
0-1m				0.5	160	55			40													45	110
1-2m				0.5	220	NL[#14]			60													70	240
2-4m				0.5	310	NL[#14]			95													110	440
>4m				0.5	540	NL[#14]			170													200	NL[#14]
NEPM 2013 Management Limits, C/I, Fine Soil											800[#4]	1000[#4]				800	1000	5000	10000				
NEPM 2013 Management Limits, R/P&POS, Fine Soil											800[#4]	1000[#4]				800	1000	3500	10000				
Field_ID	**Sample_Depth_Range**	**Sampled_Date_Time**																					
BH302_0.1	0.1	29/11/2021	-	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<500	<500	<500	<500	<20	<500	<1000	<1000	-	<1000	<20	<500
BH302_1	1	29/11/2021	-	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50	<20	<50	<100	<100	-	<100	<20	<50
BH302_3.5	3.5	29/11/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH303_0.5	0.5	3/12/2021	-	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	54	65	119	<20	<50	<100	<100	-	<100	<20	<50
BH303_3.5	3.5	3/12/2021	-	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50	<20	<50	<100	<100	-	<100	<20	<50
BH303_5.0	5	3/12/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH304_0.5	0.5	29/11/2021	-	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	170	180	350	<20	<50	290	130	-	420	<20	<50
BH304_3	3	29/11/2021	-	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50	<20	<50	<100	<100	-	<100	<20	<50
BH305A_0.1	0.1	30/11/2021	-	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	23	170	200	393	<20	<50	290	170	-	460	<20	<50
BH305A_2.0	2	30/11/2021	-	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50	<20	<50	<100	<100	-	<100	<20	<50
BH306_0.1	0.1	2/12/2021	-	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	120	110	230	<20	<50	190	<100	-	190	<20	<50
BH306_1.5	1.5	2/12/2021	-	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	61	57	118	<20	<50	<100	<100	-	<100	<20	<50
BH306_5.0	5	2/12/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA01_0.5	0.5	27/04/2022		< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	-	< 20	< 20	< 50	< 50	< 50	< 20	< 50	< 100	< 100	-	< 100	< 20	< 50
HA01_1	1	27/04/2022		< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	-	< 20	< 20	< 50	< 50	< 50	< 20	< 50	< 100	< 100	-	< 100	< 20	< 50
HA02_0.3	0.3	27/04/2022		< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	-	< 20	< 20	92	65	157	< 20	< 50	130	< 100	-	130	< 20	< 50
HA02_0.8	0.8	27/04/2022		< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	-	< 20	< 20	< 50	< 50	< 50	< 20	< 50	< 100	< 100	-	< 100	< 20	< 50
HA02_1.6	1.6	27/04/2022		< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	-	< 20	< 20	< 50	< 50	< 50	< 20	< 50	< 100	< 100	-	< 100	< 20	< 50
BH317_0.0-0.2	0-0.2	10/06/2022	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	31	58	57	146	<20	<50	120	130	-	250	<20	<50
BH317_1.0-1.1	1-1.1	10/06/2022	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50	<20	<50	<100	<100	-	<100	<20	<50
BH318_0.0-0.2	0-0.2	10/06/2022	<0.5	<0.1	<0.1	<0.1	0.4	0.2	0.6	-	<20	<20	100	<50	100	<20	<50	170	<100	-	170	<20	<50
BH318_0.5-0.7	0.5-0.7	10/06/2022	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	93	<50	93	<20	<50	150	<100	-	150	<20	<50
BH319_0.0-0.2	0-0.2	10/06/2022	<0.5	<0.1	<0.1	<0.1	0.2	0.2	0.4	-	<20	<20	<50	<50	<50	<20	<50	<100	<100	-	<100	<20	<50
BH319_1.0-1.1	1-1.1	10/06/2022	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50	<20	<50	<100	<100	-	<100	<20	<50
BH320_0-0.2	0-0.2	10/06/2022	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50	<20	<50	<100	<100	-	<100	<20	<50
BH320_1.0-1.1	1-1.1	10/06/2022	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50	<20	<50	<100	<100	-	<100	<20	<50
HA401_0.1-0.2	0.1-0.2	31/08/2022	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
HA401_0.4-0.45	0.4-0.45	31/08/2022	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
HA402_0.3-0.5	0.3-0.5	31/08/2022	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	94	61	160	<25	<25	140	<120	<100	<210	<25	<25
BH402_2.1-2.5	2.1-2.5	31/08/2022	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
HA404_0.1-0.2	0.1-0.2	31/08/2022	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
HA405_0.1-0.2	0.1-0.2	31/08/2022	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
400QD1	BH405_0.1-0.2	31/08/2022	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
400QT1	BH405_0.1-0.2	31/08/2022	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50	<20	<50	<100	<100	<101	<100	<20	<50
HA406_0.1-0.2	0.1-0.2	31/08/2022	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
HA406_0.75-0.9	0.75-0.9	31/08/2022	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
BH408_0.1-0.2	0.1-0.2	31/08/2022	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	39	720	500	1300	<25	55	1100	180	<100	1300	<25	55
BH408_1.0-1.5	1-1.5	31/08/2022	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	540	290	840	<25	28	750	<120	<100	780	<25	28
BH408_2.1-2.4	2.1-2.4	31/08/2022	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
BH409_0.1-0.2	0.1-0.2	31/08/2022	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	46	57	<110	<25	<25	<90	<120	<100	<210	<25	<25
BH409_0.4-0.6	0.4-0.6	31/08/2022	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
HA410_0.1-0.2	0.1-0.2	31/08/2022	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	83	63	150	<25	<25	130	<120	<100	<210	<25	<25
BH412_0.1-0.2	0.1-0.2	1/09/2022	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	62	120	99	290	<25	76	170	<120	<100	250	<25	76
HA413_0.2-0.3	0.2-0.3	1/09/2022	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	180	110	290	<25	<25	250	<120	<100	250	<25	<25
HA414_0.1-0.2	0.1-0.2	1/09/2022	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
BH414_1.0-1.1	1-1.1	1/09/2022	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
BH415_0.1-0.2	0.1-0.2	1/09/2022	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	48	110	160	<25	<25	110	<120	<100	<210	<25	<25
HA416_0.1-0.2	0.1-0.2	1/09/2022	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	48	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
400QD2	HA416_0.1-0.2	1/09/2022	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	290	140	420	<25	<25	370	<120	<100	370	<25	<25
400QT2	HA416_0.1-0.2	31/08/2022	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50	<20	<50	<100	<100	<101	<100	<20	<50
HA417_0.1-0.2	0.1-0.2	1/09/2022	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
HA417_0.4-0.5	0.4-0.5	1/09/2022	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
HA418_0.15-0.25	0.15-0.25	1/09/2022	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
HA418_0.7-0.8	0.7-0.8	1/09/2022	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
BH419_0.5-0.6	0.5-0.6	5/09/2022	<0.6	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	64	54	120	<25	<25	110	<120	<100	<210	<25	<25
BH420_0.5-0.5	0.5-0.6	5/09/2022	<0.6	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	87	140	220	<25	<25	180	<120	<100	<210	<25	<25
BH421_0.5-0.6	0.5-0.6	5/09/2022	<0.6	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
BH421_0.9-1.0	0.9-1.0	5/09/2022	<0.6	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
BH422_0.4-0.5	0.4-0.5	5/09/2022	<0.6	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
BH422_0.8-1.0	0.8-1.0	5/09/2022	<0.6	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
BH425M_0.5-0.7	0.5-0.7	5/09/2022	<0.6	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	48	62	110	<25	<25	96	<120	<100	<210	<25	<25
BH425M_1.5-1.6	1.5-1.6	5/09/2022	<0.6	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
BH425M_1.8-2.0	1.8-2.0	5/09/2022	<0.6	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
BH425M_4.0-4.2	4.0-4.2	5/09/2022	<0.6	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
400TB3		5/09/2022	<0.6	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	-	-	-	-	-	-	-	-	-	-	-	-	-
400TS4		5/09/2022	-	[72%]	[80%]	[83%]	[84%]	[84%]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP403_0.1	0.1	7/09/2022	<0.6	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	46	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
TP403_0.5	0.5	7/09/2022	<0.6	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
TP403_2.0	2	5/09/2022	<0.6	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	68	110	180	<25	<25	140	<120	<100	<210	<25	<25
TP423_0.1	0.1	7/09/2022	<0.6	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	130	120	250	<25	<25	220	<120	<100	220	<25	<25
TP423_1.0	1	7/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP424_0.1-0.2	0.1-0.2	7/09/2022	<0.6	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	58	<45	<45	<110	<25	60	<90	<120	<100	<210	<25	60
TP424_0.5	0.5	7/09/2022	<0.6	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
TP424_1.5	1.5	7/09/2022	<0.6	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
TP424_2.5	2.5	7/09/2022	<0.6	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
TP427_0.1	0.1	7/09/2022	<0.6	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
TP427_0.5	0.5	7/09/2022	<0.6	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	72	56	130	<25	<25	120	<120	<100	<210	<25	<25
400QD3(QA101)	TP403_0.5	5/09/2022	<0.6	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	<20	<20	<45	<45	<110	<25	<25	<90	<120	<100	<210	<25	<25
400QT3(QA101)	TP403_0.5	5/09/2022	<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	280	460	<50	<20	<50	<100	<100	<101	1000	<20	<50
400TB5		7/09/2022	<0.6	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.6	-	-	-	-	-	-	-	-	-	-	-	-	-
400TS6		7/09/2022	-	[93%]	[96%]	[96%]	[97%]	[97%]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

			PAH																							
			BaP TEQ (zero)	Benzo(a)pyrene TEQ (half LOR)_	Benzo(a)pyrene TEQ (upper bound) *	1-Methylnaphthalene	2-methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b+j)fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	PAHs (Sum of total)	Total PAH (NEPM/WHO 16)	Phenanthrene	Pyrene
			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
LOR			0.5	0.5	0.5	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	0.5	0.8	0.1	0.1
NEPM 2013 EIL Comm./Ind., low pH, CEC, clay content - fresh																										
0-2m																					370[#1]					
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - fresh																										
0-2m																					170[#1]					
NSW 2014 General Solid Waste CT1 (No Leaching)												0.8										200				
NSW 2014 General Solid Waste SCC1 (with leached)												10														
NSW 2014 Restricted Solid Waste CT2 (No Leaching)												3.2														
NSW 2014 Restricted Solid Waste SCC2 (with leached)												23														
PFAS NEMP 2.0 Table 2 Health Industrial/Commercial (HIL C)																										
PFAS NEMP 2.0 Table 2 Health Residential min soil access (HIL B)																										
PFAS NEMP 2.0 Table 3 Ecological Direct Exposure - All Land Uses																										
PFAS NEMP 2.0 Table 3 Ecological Indirect Exposure - All Land Uses																										
NEPM 2013 ESL Comm./Ind., Fine Soil																										
0-2m												1.4[#5]														
NEPM 2013 ESL UR/POS, Fine Soil																										
0-2m												0.7[#6]														
NEPM 2013 HIL, Commercial/Industrial D				40[#7]																		4000[#8]				
NEPM 2013 HIL, Recreational C				3[#7]																		300[#8]				
NEPM 2013 HIL, Residential B				4[#7]																		400[#8]				
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																										
0-1m																					3					
1-2m																					NL[#14]					
2-4m																					NL[#14]					
>4m																					NL[#14]					
NEPM 2013 Management Limits, C/I, Fine Soil																										
NEPM 2013 Management Limits, R/P&POS, Fine Soil																										
Field_ID	**Sample_Depth_Range**	**Sampled_Date_Time**																								
BH302_0.1	0.1	29/11/2021	4.7	4.7	4.7	-	-	<0.5	0.7	0.6	2.4	3.1	2.2	2.7	3.5	2.7	0.6	5.1	<0.5	2.3	<0.5	35.7	-	3.9	5.9
BH302_1	1	29/11/2021	<0.5	0.6	1.2	-	-	<0.5	<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
BH302_3.5	3.5	29/11/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH303_0.5	0.5	3/12/2021	0.7	1	1.3	-	-	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	0.5	<0.5	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	2.7	-	<0.5	0.8
BH303_3.5	3.5	3/12/2021	<0.5	0.6	1.2	-	-	<0.5	<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
BH303_5.0	5	3/12/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH304_0.5	0.5	29/11/2021	2	2.3	2.5	-	-	<0.5	<0.5	<0.5	0.9	1.6	1	1.3	0.9	1.4	<0.5	1.8	<0.5	0.8	<0.5	12.6	-	0.6	2.3
BH304_3	3	29/11/2021	<0.5	0.6	1.2	-	-	<0.5	<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
BH305A_0.1	0.1	30/11/2021	<0.5	0.6	1.2	-	-	<0.5	<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
BH305A_2.0	2	30/11/2021	<0.5	0.6	1.2	-	-	<0.5	<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
BH306_0.1	0.1	2/12/2021	1.6	1.8	2.1	-	-	<0.5	<0.5	<0.5	0.9	1.2	0.9	1.1	0.9	1.1	<0.5	1.6	<0.5	0.8	<0.5	10.8	-	0.7	1.6
BH306_1.5	1.5	2/12/2021	<0.5	0.6	1.2	-	-	<0.5	<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
BH306_5.0	5	2/12/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA01_0.5	0.5	27/04/2022	< 0.5	0.6	1.2	-	-	< 0.5	< 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
HA01_1	1	27/04/2022	< 0.5	0.6	1.2	-	-	< 0.5	< 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	1	-	< 0.5	0.5
HA02_0.3	0.3	27/04/2022	1.6	1.9	2.1	-	-	< 0.5	< 0.5	< 0.5	1.3	1.2	0.8	1.4	0.7	1.2	< 0.5	2.7	< 0.5	0.7	< 0.5	15	-	2.2	2.6
HA02_0.8	0.8	27/04/2022	< 0.5	0.6	1.2	-	-	< 0.5	< 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
HA02_1.6	1.6	27/04/2022	< 0.5	0.6	1.2	-	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1	< 0.5	< 0.5	< 0.5	2.7	-	0.8	0.9
BH317_0.0-0.2	0-0.2	10/06/2022	<0.5	0.6	1.2	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	0.6	-	<0.5	<0.5
BH317_1.0-1.1	1-1.1	10/06/2022	<0.5	0.6	1.2	-	-	<0.5	<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
BH318_0.0-0.2	0-0.2	10/06/2022	1	1.3	1.6	-	-	<0.5	<0.5	<1	0.6	0.8	<0.5	0.8	<0.5	1.1	<0.5	1.8	<0.5	<0.5	<0.5	6.9	-	<1	1.8
BH318_0.5-0.7	0.5-0.7	10/06/2022	2	2.2	2.5	-	-	<0.5	<0.5	<0.5	1	1.5	0.9	1.9	1	1.7	<0.5	2	<0.5	0.7	<0.5	13	-	<1	2.1
BH319_0.0-0.2	0-0.2	10/06/2022	<0.5	0.6	1.2	-	-	<0.5	<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
BH319_1.0-1.1	1-1.1	10/06/2022	<0.5	0.6	1.2	-	-	<0.5	<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
BH320_0-0.2	0-0.2	10/06/2022	1.3	1.5	1.8	-	-	<0.5	<0.5	<0.5	0.7	1	0.5	0.7	0.6	0.8	<0.5	0.6	<0.5	0.5	<0.5	7.3	-	0.5	1.4
BH320_1.0-1.1	1-1.1	10/06/2022	<0.5	0.6	1.2	-	-	<0.5	<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
HA401_0.1-0.2	0.1-0.2	31/08/2022	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.8	<0.8	<0.1	<0.1
HA401_0.4-0.45	0.4-0.45	31/08/2022	0.7	0.8	0.8	<0.1	<0.1	<0.1	<0.1	0.2	0.5	0.5	0.6	0.2	0.3	0.4	<0.1	1	<0.1	0.3	<0.1	5.8	5.8	0.6	1
HA402_0.3-0.5	0.3-0.5	31/08/2022	0.3	0.4	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.2	0.3	0.1	0.2	0.2	<0.1	0.4	<0.1	0.2	<0.1	2.5	2.5	0.2	0.4
BH402_2.1-2.5	2.1-2.5	31/08/2022	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.8	<0.8	<0.1	<0.1
HA404_0.1-0.2	0.1-0.2	31/08/2022	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.8	<0.8	<0.1	<0.1
HA405_0.1-0.2	0.1-0.2	31/08/2022	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.8	<0.8	<0.1	<0.1
400QD1	BH405_0.1-0.2	31/08/2022	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.8	<0.8	<0.1	<0.1
400QT1	BH405_0.1-0.2	31/08/2022	<0.5	0.6	1.2	-	-	<0.5	<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
HA406_0.1-0.2	0.1-0.2	31/08/2022	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.8	<0.8	<0.1	<0.1
HA406_0.75-0.9	0.75-0.9	31/08/2022	0.3	0.3	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.2	0.2	<0.1	0.1	0.1	<0.1	0.2	<0.1	0.1	<0.1	1.5	1.5	<0.1	0.3
BH408_0.1-0.2	0.1-0.2	31/08/2022	27	27	27	0.4	0.5	0.3	4.5	5.6	20	19	23	9.4	7.6	18	2.2	33	1.4	8.6	0.7	210	210	21	35
BH408_1.0-1.5	1-1.5	31/08/2022	18	18	18	0.3	0.3	0.3	4.1	5.8	15	12	15	5.9	4.1	13	1.3	28	1.4	4.9	0.3	160	160	21	29
BH408_2.1-2.4	2.1-2.4	31/08/2022	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.8	<0.8	<0.1	<0.1
BH409_0.1-0.2	0.1-0.2	31/08/2022	1	1.1	1.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.4	0.8	0.9	0.3	0.3	0.3	<0.1	0.4	<0.1	0.3	<0.1	4.4	4.4	<0.1	0.6
BH409_0.4-0.6	0.4-0.6	31/08/2022	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.8	<0.8	<0.1	0.1
HA410_0.1-0.2	0.1-0.2	31/08/2022	2.3	2.3	2.3	0.1	<0.1	<0.1	0.5	0.6	1.5	1.6	1.9	0.8	0.6	1.3	0.2	3.1	<0.1	0.7	0.1	18	18	1.9	2.9
BH412_0.1-0.2	0.1-0.2	1/09/2022	1.7	1.7	1.7	<0.1	<0.1	<0.1	0.3	0.3	0.9	1.2	1.5	0.6	0.5	0.9	0.2	1.8	<0.1	0.6	<0.1	11	11	0.8	1.8
HA413_0.2-0.3	0.2-0.3	1/09/2022	13	13	13	0.1	<0.1	<0.1	1.6	1.7	8.4	8.8	11	4.4	3.9	8.2	1.1	16	0.4	4.5	0.3	95	95	7.3	17
HA414_0.1-0.2	0.1-0.2	1/09/2022	1.1	1.1	1.1	<0.2	<0.2	<0.2	<0.2	<0.2	0.6	0.8	0.9	0.4	0.4	0.6	<0.2	1	<0.2	0.4	<0.2	7.1	7.1	0.4	1.1
BH414_1.0-1.1	1-1.1	1/09/2022	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.8	<0.8	<0.1	<0.1
BH415_0.1-0.2	0.1-0.2	1/09/2022	1.2	1.2	1.2	<0.1	<0.1	<0.1	0.1	0.1	0.3	0.9	0.9	0.3	0.6	0.3	0.1	0.3	<0.1	0.5	<0.1	5.1	5.1	0.1	0.4
HA416_0.1-0.2	0.1-0.2	1/09/2022	2.5	2.5	2.5	<0.1	<0.1	<0.1	0.5	0.6	1.6	1.7	2	0.9	0.7	1.4	0.2	3.3	0.2	0.8	<0.1	19	19	1.8	3.2
400QD2	HA416_0.1-0.2	1/09/2022	14	14	14	0.3	0.3	0.5	3.1	6.3	13	9.4	11	5	3.3	9.8	1.1	24	1.9	4.1	0.4	130	130	15	23
400QT2	HA416_0.1-0.2	31/08/2022	2.6	2.9	3.1	-	-	<0.5	<0.5	0.8	1.9	1.9	1.3	2.3	1.7	2	<0.5	4.8	<0.5	1.2	<0.5	26	-	3.3	4.6
HA417_0.1-0.2	0.1-0.2	1/09/2022	0.4	0.5	0.5	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.3	0.4	0.1	0.1	0.2	<0.1	0.3	<0.1	0.2	<0.1	2.3	2.3	0.1	0.4
HA417_0.4-0.5	0.4-0.5	1/09/2022	2.7	2.7	2.7	<0.1	<0.1	<0.1	0.3	0.4	1.6	1.8	2.1	0.9	0.9	1.4	0.2	2.8	<0.1	1	<0.1	18	18	1.2	2.8
HA418_0.15-0.25	0.15-0.25	1/09/2022	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.8	<0.8	<0.1	<0.1
HA418_0.7-0.8	0.7-0.8	1/09/2022	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.8	<0.8	<0.1	<0.1
BH419_0.5-0.6	0.5-0.6	5/09/2022	1.4	1.4	1.4	<0.1	<0.1	0.1	<0.1	0.2	1.0	1.0	1.1	0.5	0.7	0.9	0.2	1.8	<0.1	0.7	<0.1	9.3	9.3	0.8	1.8
BH420_0.5-0.5	0.5-0.6	5/09/2022	0.4	0.4	0.5	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	0.3	0.3	0.2	0.2	0.3	<0.1	0.6	<0.1	0.2	<0.1	2.8	2.8	0.3	0.6
BH421_0.5-0.6	0.5-0.6	5/09/2022	0.2	0.3	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.2	0.2	<0.1	0.1	0.2	<0.1	0.4	<0.1	0.1	<0.1	1.7	1.7	0.2	0.4
BH421_0.9-1.0	0.9-1.0	5/09/2022	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.8	<0.8	<0.1	<0.1
BH422_0.4-0.5	0.4-0.5	5/09/2022	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.8	<0.8	<0.1	<0.1
BH422_0.8-1.0	0.8-1.0	5/09/2022	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.8	<0.8	<0.1	<0.1
BH425M_0.5-0.7	0.5-0.7	5/09/2022	<0.2	0.3	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.2	0.2	<0.1	0.1	0.2	<0.1	0.4	<0.1	<0.1	<0.1	1.8	1.8	0.2	0.5
BH425M_1.5-1.6	1.5-1.6	5/09/2022	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.8	<0.8	<0.1	<0.1
BH425M_1.8-2.0	1.8-2.0	5/09/2022	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.8	<0.8	<0.1	<0.1
BH425M_4.0-4.2	4.0-4.2	5/09/2022	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.8	<0.8	<0.1	<0.1
400TB3		5/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
400TS4		5/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP403_0.1	0.1	7/09/2022	1.6	1.6	1.7	<0.1	<0.1	0.3	<0.1	0.4	1.0	1.2	1.3	0.5	1.1	1.0	0.2	1.8	<0.1	0.9	<0.1	11	11	0.7	1.9
TP403_0.5	0.5	7/09/2022	0.3	0.4	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	0.3	0.3	0.1	0.2	0.2	<0.1	0.5	<0.1	0.2	<0.1	2.3	2.3	0.2	0.5
TP403_2.0	2	5/09/2022	0.5	0.6	0.6	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	0.4	0.4	0.2	0.2	0.3	<0.1	0.6	<0.1	0.3	<0.1	3.8	3.8	0.3	0.7
TP423_0.1	0.1	7/09/2022	4.2	4.2	4.2	<0.1	<0.1	0.6	<0.1	0.6	2.9	3.2	3.6	1.4	2.2	2.8	0.5	5.0	0.1	2.2	<0.1	27	27	2.1	5.2
TP423_1.0	1	7/09/2022	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.8	<0.8	-	-
TP424_0.1-0.2	0.1-0.2	7/09/2022	0.5	0.6	0.6	<0.1	<0.1	<0.1	<0.1	<0.1	0.4	0.4	0.5	0.2	0.3	0.4	<0.1	0.8	<0.1	0.3	<0.1	3.7	3.7	0.3	0.7
TP424_0.5	0.5	7/09/2022	0.7	0.8	0.9	<0.1	<0.1	0.1	<0.1	0.1	0.6	0.6	0.7	0.3	0.5	0.5	<0.1	1.1	<0.1	0.4	<0.1	5.5	5.5	0.4	1.1
TP424_1.5	1.5	7/09/2022	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.8	<0.8	<0.1	<0.1
TP424_2.5	2.5	7/09/2022	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.8	<0.8	<0.1	<0.1
TP427_0.1	0.1	7/09/2022	0.4	0.5	0.5	<0.1	<0.1	<0.1	<0.1	0.1	0.3	0.3	0.4	0.2	0.3	0.3	<0.1	0.7	<0.1	0.2	<0.1	3.4	3.4	0.4	0.7
TP427_0.5	0.5	7/09/2022	3	3	3	<0.1	<0.1	0.3	<0.1	0.4	2.0	2.2	2.6	1.1	1.6	2.1	0.4	3.6	<0.1	1.6	<0.1	19	19	1.5	3.8
400QD3(QA101)	TP403_0.5	5/09/2022	0.4	0.4	0.5	<0.1	<0.1	<0.1	<0.1	0.1	0.3	0.3	0.3	0.1	0.3	0.3	<0.1	0.6	<0.1	0.2	<0.1	2.9	2.9	0.4	0.6
400QT3(QA101)	TP403_0.5	5/09/2022	0.7	1	1.3	-	-	<0.5	<0.5	<0.5	0.6	0.6	<0.5	0.6	<0.5	0.6	<0.5	0.8	<0.5	<0.5	<0.5	5	-	0.6	1.2
400TB5		7/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
400TS6		7/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

			Metals								Phenols	OCP																	
			Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	Phenol (total)	Vic EPA IWRG 621 Other OCP (Total)*	Vic EPA IWRG 621 OCP (Total)*	4,4-DDE	Aldrin	Aldrin + Dieldrin	Chlordane	gamma-Chlordane	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Heptachlor	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
LOR			1	0.3	0.5	0.5	1	0.05	0.5	2	0.5	0.1	0.1	0.05	0.05	0.05	0.1	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.5
NEPM 2013 EIL Comm./Ind., low pH, CEC, clay content - fresh																													
0-2m			160		680	170	1800		290	750									640[#1]										
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - fresh																													
0-2m			100		410	160	1100		170	520									180[#1]										
NSW 2014 General Solid Waste CT1 (No Leaching)			100	20	100		100	4	40													60[#3]	60[#3]	60[#3]					
NSW 2014 General Solid Waste SCC1 (with leached)			500	100	1900		1500	50	1050		518											108	108	108					
NSW 2014 Restricted Solid Waste CT2 (No Leaching)			400	80	400		400	16	160													240[#3]	240[#3]	240[#3]					
NSW 2014 Restricted Solid Waste SCC2 (with leached)			2000	400	7600		6000	200	4200		2073											432	432	432					
PFAS NEMP 2.0 Table 2 Health Industrial/Commercial (HIL C)																													
PFAS NEMP 2.0 Table 2 Health Residential min soil access (HIL B)																													
PFAS NEMP 2.0 Table 3 Ecological Direct Exposure - All Land Uses																													
PFAS NEMP 2.0 Table 3 Ecological Indirect Exposure - All Land Uses																													
NEPM 2013 ESL Comm./Ind., Fine Soil																													
0-2m																													
NEPM 2013 ESL UR/POS, Fine Soil																													
0-2m																													
NEPM 2013 HIL, Commercial/Industrial D			3000[#9]	900		240000	1500[#10]	730[#11]	6000	400000	240000					45	530			3600					100	50	80	2500	160
NEPM 2013 HIL, Recreational C			300[#9]	90		17000	600[#10]	80[#11]	1200	30000	40000					10	70			400					20	10	10	400	30
NEPM 2013 HIL, Residential B			500[#9]	150		30000	1200[#10]	120[#11]	1200	60000	45000					10	90			600					20	10	15	500	30
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																													
0-1m																													
1-2m																													
2-4m																													
>4m																													
NEPM 2013 Management Limits, C/I, Fine Soil																													
NEPM 2013 Management Limits, R/P&POS, Fine Soil																													
Field_ID	**Sample_Depth_Range**	**Sampled_Date_Time**																											
BH302_0.1	0.1	29/11/2021	3	<0.4	15	52	34	0.2	31	65	<0.5	<1	<1	<0.5	<0.5	<0.5	<1	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
BH302_1	1	29/11/2021	9.1	<0.4	31	19	25	<0.1	5.7	17	<0.5	<0.1	<0.1	<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	<0.5
BH302_3.5	3.5	29/11/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH303_0.5	0.5	3/12/2021	3.6	<0.4	24	27	38	<0.1	20	66	<0.5	<0.1	<0.1	<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	<0.5
BH303_3.5	3.5	3/12/2021	41	<0.4	28	34	37	<0.1	5.1	43	<0.5	<0.1	<0.1	<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	<0.5
BH303_5.0	5	3/12/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH304_0.5	0.5	29/11/2021	8.3	<0.4	15	9.8	130	0.2	<5	57	<0.5	<1	<1	<0.5	<0.5	<0.5	<1	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
BH304_3	3	29/11/2021	6.1	<0.4	18	6	20	<0.1	6.1	20	<0.5	<0.1	<0.1	<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	<0.5
BH305A_0.1	0.1	30/11/2021	4.1	<0.4	14	71	39	0.2	9.7	110	<0.5	<0.1	<0.1	<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	<0.5
BH305A_2.0	2	30/11/2021	8.1	<0.4	36	7.2	36	<0.1	10	17	<0.5	<0.1	<0.1	<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	<0.5
BH306_0.1	0.1	2/12/2021	5.2	<0.4	14	20	77	0.2	6.5	71	<0.5	<0.1	<0.1	<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	<0.5
BH306_1.5	1.5	2/12/2021	6.7	<0.4	24	<5	27	<0.1	7.7	9.7	<0.5	<0.1	<0.1	<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	<0.5
BH306_5.0	5	2/12/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA01_0.5	0.5	27/04/2022	2.2	< 0.4	9.9	6.6	10	< 0.1	< 5	19	-	< 0.1	< 0.1	< 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	< 0.5
HA01_1	1	27/04/2022	6.8	< 0.4	21	9.4	44	0.2	5.3	18	-	< 0.1	< 0.1	< 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	< 0.5
HA02_0.3	0.3	27/04/2022	11	< 0.4	28	360	87	0.2	12	270	-	< 0.1	< 0.1	< 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	< 0.5
HA02_0.8	0.8	27/04/2022	< 2	< 0.4	< 5	22	35	0.2	11	180	-	< 0.1	< 0.1	< 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	< 0.5
HA02_1.6	1.6	27/04/2022	9.2	< 0.4	10	17	45	< 0.1	< 5	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH317_0.0-0.2	0-0.2	10/06/2022	6.5	<0.4	13	53	110	0.2	9.4	130	<0.5	<0.1	<0.1	<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	<0.5
BH317_1.0-1.1	1-1.1	10/06/2022	7.6	<0.4	23	13	60	0.1	5.5	32	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH318_0.0-0.2	0-0.2	10/06/2022	11	<0.4	16	75	140	0.4	11	190	<0.5	<0.1	<0.1	<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	<0.5
BH318_0.5-0.7	0.5-0.7	10/06/2022	9.6	<0.4	23	15	97	0.4	5.2	61	<0.5	<0.1	<0.1	<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	<0.5
BH319_0.0-0.2	0-0.2	10/06/2022	<2	<0.4	21	50	6.5	<0.1	94	59	<0.5	<0.1	<0.1	<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	<0.5
BH319_1.0-1.1	1-1.1	10/06/2022	8.1	<0.4	19	6.3	39	<0.1	<5	8.4	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH320_0-0.2	0-0.2	10/06/2022	42	0.5	17	460	730	1	10	290	<0.5	<0.1	0.14	0.08	<0.05	<0.05	<0.1	-	0.06	0.14	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH320_1.0-1.1	1-1.1	10/06/2022	7.7	<0.4	25	<5	35	<0.1	<5	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA401_0.1-0.2	0.1-0.2	31/08/2022	2	<0.3	7.5	9.9	13	<0.05	4.8	35	<0.5	-	<1	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
HA401_0.4-0.45	0.4-0.45	31/08/2022	4	<0.3	7.2	16	28	0.08	5.1	34	<0.5	-	<1	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
HA402_0.3-0.5	0.3-0.5	31/08/2022	3	<0.3	9.6	18	30	<0.05	6.9	39	<0.5	-	<1	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
BH402_2.1-2.5	2.1-2.5	31/08/2022	<1	<0.3	2	13	8	<0.05	<0.5	3.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA404_0.1-0.2	0.1-0.2	31/08/2022	1	<0.3	4.5	7.6	7	<0.05	2.2	17	<0.5	-	<1	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
HA405_0.1-0.2	0.1-0.2	31/08/2022	2	<0.3	5.5	4.3	6	<0.05	2.8	11	<0.5	-	<1	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
400QD1	BH405_0.1-0.2	31/08/2022	2	<0.3	6.2	5.8	7	<0.05	3.4	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
400QT1	BH405_0.1-0.2	31/08/2022	<2	<0.4	8.3	7.1	9.1	<0.1	<5	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA406_0.1-0.2	0.1-0.2	31/08/2022	2	<0.3	6.5	13	10	<0.05	3.8	42	0.5	-	<1	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
HA406_0.75-0.9	0.75-0.9	31/08/2022	4	<0.3	7.1	20	45	0.05	4.8	52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH408_0.1-0.2	0.1-0.2	31/08/2022	7	0.4	9.9	48	260	0.96	5.5	210	<0.5	-	<1	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
BH408_1.0-1.5	1-1.5	31/08/2022	5	<0.3	13	21	180	1.1	3.4	85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH408_2.1-2.4	2.1-2.4	31/08/2022	5	<0.3	7.5	24	14	<0.05	<0.5	6.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH409_0.1-0.2	0.1-0.2	31/08/2022	2	<0.3	6.2	4.8	4	<0.05	<0.5	7.8	<0.5	-	<1	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
BH409_0.4-0.6	0.4-0.6	31/08/2022	5	<0.3	9.8	5.2	21	<0.05	0.7	8.1	<0.5	-	<1	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
HA410_0.1-0.2	0.1-0.2	31/08/2022	6	0.4	14	370	290	0.82	5.4	160	<0.5	-	<1	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
BH412_0.1-0.2	0.1-0.2	1/09/2022	5	1.5	13	3400	470	9.6	11	400	<0.5	-	<1	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
HA413_0.2-0.3	0.2-0.3	1/09/2022	6	<0.3	17	16	76	0.25	2.6	34	<0.5	-	<1	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
HA414_0.1-0.2	0.1-0.2	1/09/2022	15	0.9	73	970	350	0.42	16	2400	2	-	<2	<0.2	<0.2	-	-	<0.2	<0.2	-	<0.4	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-
BH414_1.0-1.1	1-1.1	1/09/2022	3	<0.3	4.2	3	11	<0.05	<0.5	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH415_0.1-0.2	0.1-0.2	1/09/2022	5	<0.3	9.4	72	110	0.88	8.1	160	<0.5	-	**5**	<0.1	**0.4**	-	-	<0.1	<0.1	-	**4.8**	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
HA416_0.1-0.2	0.1-0.2	1/09/2022	7	0.5	15	46	300	2.2	5.6	170	<0.5	-	<1	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
400QD2	HA416_0.1-0.2	1/09/2022	8	0.9	15	67	340	3.8	7	330	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
400QT2	HA416_0.1-0.2	31/08/2022	10	0.8	19	72	460	5.7	8.3	320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA417_0.1-0.2	0.1-0.2	1/09/2022	3	0.3	15	65	44	0.42	7.8	150	<0.5	-	<1	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
HA417_0.4-0.5	0.4-0.5	1/09/2022	7	<0.3	14	30	110	0.39	4.3	89	<0.5	-	<1	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
HA418_0.15-0.25	0.15-0.25	1/09/2022	5	<0.3	14	14	23	<0.05	3.6	32	<0.5	-	<1	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
HA418_0.7-0.8	0.7-0.8	1/09/2022	6	<0.3	14	27	12	<0.05	<0.5	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH419_0.5-0.6	0.5-0.6	5/09/2022	14	<0.3	16	63	79	0.3	12	89	<0.5	<1	<1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
BH420_0.5-0.5	0.5-0.6	5/09/2022	8	<0.3	13	45	64	0.25	15	75	<0.5	<1	<1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
BH421_0.5-0.6	0.5-0.6	5/09/2022	5	<0.3	7.4	19	19	<0.05	23	35	<0.5	<1	<1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
BH421_0.9-1.0	0.9-1.0	5/09/2022	4	<0.3	14	6.4	37	<0.05	1.5	7.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH422_0.4-0.5	0.4-0.5	5/09/2022	5	<0.3	17	2	16	<0.05	1.1	5.7	<0.5	<1	<1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
BH422_0.8-1.0	0.8-1.0	5/09/2022	2	<0.3	9.9	2.7	16	<0.05	2.5	11	<0.5	<1	<1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
BH425M_0.5-0.7	0.5-0.7	5/09/2022	4	<0.3	11	16	22	0.08	6.9	58	<0.5	<1	<1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
BH425M_1.5-1.6	1.5-1.6	5/09/2022	4	<0.3	15	10	15	<0.05	1.6	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH425M_1.8-2.0	1.8-2.0	5/09/2022	18	<0.3	11	17	15	<0.05	<0.5	5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH425M_4.0-4.2	4.0-4.2	5/09/2022	-	-	-	-	15	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
400TB3		5/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
400TS4		5/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP403_0.1	0.1	7/09/2022	3	0.7	7.8	30	85	0.18	6.2	89	<0.5	<1	<1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
TP403_0.5	0.5	7/09/2022	3	<0.3	16	21	61	0.23	13	46	<0.5	<1	<1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
TP403_2.0	2	5/09/2022	6	<0.3	9.2	25	170	0.27	4.9	160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP423_0.1	0.1	7/09/2022	11	0.7	19	74	300	2.4	9	290	<0.5	<1	<1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
TP423_1.0	1	7/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP424_0.1-0.2	0.1-0.2	7/09/2022	7	<0.3	19	64	71	0.27	16	130	0.8	<1	<1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
TP424_0.5	0.5	7/09/2022	4	<0.3	36	24	67	0.24	23	69	<0.5	<1	<1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
TP424_1.5	1.5	7/09/2022	5	<0.3	16	11	23	0.08	3.9	12	<0.5	<1	<1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
TP424_2.5	2.5	7/09/2022	5	<0.3	23	14	15	<0.05	0.9	8.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP427_0.1	0.1	7/09/2022	3	<0.3	11	20	36	0.06	6.3	56	<0.5	<1	<1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
TP427_0.5	0.5	7/09/2022	7	<0.3	13	22	140	0.34	3.1	45	<0.5	<1	<1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	-
400QD3(QA101)	TP403_0.5	5/09/2022	3	<0.3	7.2	21	50	1.3	4.1	51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
400QT3(QA101)	TP403_0.5	5/09/2022	7.3	<0.4	17	31	800	0.6	10	160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
400TB5		7/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
400TS6		7/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

			Organophosphorous Pesticides						Herbicides	Pesticides				PFAS										Polychlorinated Biphenyls
			Tokuthion	Azinophos methyl	Bolstar (Sulprofos)	Bromophos-ethyl	Chlorfenvinphos	Chlorpyrifos	Dinoseb	Isodrin	Mirex	Parathion	Pirimiphos-methyl	Perfluorohexane sulfonic acid (PFHxS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorooctanoate (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Sum of PFAS	Sum of PFHxS and PFOS	Sum of US EPA PFAS (PFOS + PFOA)*	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	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/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR			0.2	0.2	0.2	0.2	0.2	0.2	20	0.1	0.1	0.2	0.2	0.0016	0.0016	0.0008	0.0016	0.0016	0.08	0.0016	0.005	0.005	0.1
NEPM 2013 EIL Comm./Ind., low pH, CEC, clay content - fresh																							
0-2m																							
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - fresh																							
0-2m																							
NSW 2014 General Solid Waste CT1 (No Leaching)								4															<50
NSW 2014 General Solid Waste SCC1 (with leached)								7.5															<50
NSW 2014 Restricted Solid Waste CT2 (No Leaching)								16															<50
NSW 2014 Restricted Solid Waste SCC2 (with leached)								30						7.2	7.2	72							<50
PFAS NEMP 2.0 Table 2 Health Industrial/Commercial (HIL C)																10				1			
PFAS NEMP 2.0 Table 2 Health Residential min soil access (HIL B)																20				2			
PFAS NEMP 2.0 Table 3 Ecological Direct Exposure - All Land Uses															1	10							
PFAS NEMP 2.0 Table 3 Ecological Indirect Exposure - All Land Uses															0.01								
NEPM 2013 ESL Comm./Ind., Fine Soil																							
0-2m																							
NEPM 2013 ESL UR/POS, Fine Soil																							
0-2m																							
NEPM 2013 HIL, Commercial/Industrial D								2000			100												7[#13]
NEPM 2013 HIL, Recreational C								250			20												1[#13]
NEPM 2013 HIL, Residential B								340			20												1[#13]
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																							
0-1m																							
1-2m																							
2-4m																							
>4m																							
NEPM 2013 Management Limits, C/I, Fine Soil																							
NEPM 2013 Management Limits, R/P&POS, Fine Soil																							
Field_ID	**Sample_Depth_Range**	**Sampled_Date_Time**																					
BH302_0.1	0.1	29/11/2021	<0.5	<0.5	<0.5	-	<0.5	<0.5	<20	-	-	<0.5	<0.5	-	-	-	-	-	-	-	-	-	<1
BH302_1	1	29/11/2021	<0.2	<0.2	<0.2	-	<0.2	<0.2	<20	-	-	<0.2	<0.2	-	-	-	-	-	-	-	-	-	<0.1
BH302_3.5	3.5	29/11/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH303_0.5	0.5	3/12/2021	<0.2	<0.2	<0.2	-	<0.2	<0.2	<20	-	-	<0.2	<0.2	-	-	-	-	-	-	-	-	-	<0.1
BH303_3.5	3.5	3/12/2021	<0.2	<0.2	<0.2	-	<0.2	<0.2	<20	-	-	<0.2	<0.2	-	-	-	-	-	-	-	-	-	<0.1
BH303_5.0	5	3/12/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH304_0.5	0.5	29/11/2021	<0.5	<0.5	<0.5	-	<0.5	<0.5	<20	-	-	<0.5	<0.5	-	-	-	-	-	-	-	-	-	<1
BH304_3	3	29/11/2021	<0.2	<0.2	<0.2	-	<0.2	<0.2	<20	-	-	<0.2	<0.2	-	-	-	-	-	-	-	-	-	<0.1
BH305A_0.1	0.1	30/11/2021	<0.2	<0.2	<0.2	-	<0.2	<0.2	<20	-	-	<0.2	<0.2	-	-	-	-	-	-	-	-	-	<0.1
BH305A_2.0	2	30/11/2021	<0.2	<0.2	<0.2	-	<0.2	<0.2	<20	-	-	<0.2	<0.2	-	-	-	-	-	-	-	-	-	<0.1
BH306_0.1	0.1	2/12/2021	<0.2	<0.2	<0.2	-	<0.2	<0.2	<20	-	-	<0.2	<0.2	-	-	-	-	-	-	-	-	-	<0.1
BH306_1.5	1.5	2/12/2021	<0.2	<0.2	<0.2	-	<0.2	<0.2	<20	-	-	<0.2	<0.2	-	-	-	-	-	-	-	-	-	<0.1
BH306_5.0	5	2/12/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA01_0.5	0.5	27/04/2022	< 0.2	< 0.2	< 0.2	-	< 0.2	< 0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA01_1	1	27/04/2022	< 0.2	< 0.2	< 0.2	-	< 0.2	< 0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA02_0.3	0.3	27/04/2022	< 0.2	< 0.2	< 0.2	-	< 0.2	< 0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA02_0.8	0.8	27/04/2022	< 0.2	< 0.2	< 0.2	-	< 0.2	< 0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA02_1.6	1.6	27/04/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH317_0.0-0.2	0-0.2	10/06/2022	<0.2	<0.2	<0.2	-	<0.2	<0.2	<20	-	-	<0.2	<0.2	<0.005	<0.005	<0.005	-	-	-	<0.005	<0.005	<0.005	<0.1
BH317_1.0-1.1	1-1.1	10/06/2022	-	-	-	-	-	-	<20	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH318_0.0-0.2	0-0.2	10/06/2022	<0.2	<0.2	<0.2	-	<0.2	<0.2	<20	-	-	<0.2	<0.2	<0.005	0.006	<0.005	-	-	-	0.006	0.006	0.006	<0.1
BH318_0.5-0.7	0.5-0.7	10/06/2022	<0.2	<0.2	<0.2	-	<0.2	<0.2	<20	-	-	<0.2	<0.2	-	-	-	-	-	-	-	-	-	<0.1
BH319_0.0-0.2	0-0.2	10/06/2022	<0.2	<0.2	<0.2	-	<0.2	<0.2	<20	-	-	<0.2	<0.2	<0.005	<0.005	<0.005	-	-	-	<0.005	<0.005	<0.005	<0.1
BH319_1.0-1.1	1-1.1	10/06/2022	-	-	-	-	-	-	<20	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH320_0-0.2	0-0.2	10/06/2022	<0.2	<0.2	<0.2	-	<0.2	<0.2	<20	-	-	<0.2	<0.2	<0.005	<0.005	<0.005	-	-	-	<0.005	<0.005	<0.005	<0.1
BH320_1.0-1.1	1-1.1	10/06/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA401_0.1-0.2	0.1-0.2	31/08/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	-	-	-	-	-	-	-	-	-	<1
HA401_0.4-0.45	0.4-0.45	31/08/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	-	-	-	-	-	-	-	-	-	<1
HA402_0.3-0.5	0.3-0.5	31/08/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	<0.0016	<0.0016	<0.0008	<0.0016	<0.0016	<0.08	<0.0016	-	-	<1
BH402_2.1-2.5	2.1-2.5	31/08/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA404_0.1-0.2	0.1-0.2	31/08/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	-	-	-	-	-	-	-	-	-	<1
HA405_0.1-0.2	0.1-0.2	31/08/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	-	-	-	-	-	-	-	-	-	<1
400QD1	BH405_0.1-0.2	31/08/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
400QT1	BH405_0.1-0.2	31/08/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA406_0.1-0.2	0.1-0.2	31/08/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	-	-	-	-	-	-	-	-	-	<1
HA406_0.75-0.9	0.75-0.9	31/08/2022	-	-	-	-	-	-	-	-	-	-	-	<0.0016	<0.0016	<0.0008	<0.0016	<0.0016	<0.08	<0.0016	-	-	-
BH408_0.1-0.2	0.1-0.2	31/08/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	-	-	-	-	-	-	-	-	-	<1
BH408_1.0-1.5	1-1.5	31/08/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH408_2.1-2.4	2.1-2.4	31/08/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH409_0.1-0.2	0.1-0.2	31/08/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	<0.0016	<0.0016	<0.0008	<0.0016	<0.0016	<0.08	<0.0016	-	-	<1
BH409_0.4-0.6	0.4-0.6	31/08/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	-	-	-	-	-	-	-	-	-	<1
HA410_0.1-0.2	0.1-0.2	31/08/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	-	-	-	-	-	-	-	-	-	<1
BH412_0.1-0.2	0.1-0.2	1/09/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	-	-	-	-	-	-	-	-	-	<1
HA413_0.2-0.3	0.2-0.3	1/09/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	<0.0016	<0.0016	<0.0008	<0.0016	<0.0016	<0.08	<0.0016	-	-	<1
HA414_0.1-0.2	0.1-0.2	1/09/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2	<0.2	-	<0.0016	0.0057	0.0015	0.0024	0.0075	<0.08	0.0057	-	-	<2
BH414_1.0-1.1	1-1.1	1/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1
BH415_0.1-0.2	0.1-0.2	1/09/2022	-	<0.2	-	<0.2	-	1	-	<0.1	<0.1	<0.2	-	-	-	-	-	-	-	-	-	-	<1
HA416_0.1-0.2	0.1-0.2	1/09/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	-	-	-	-	-	-	-	-	-	<1
400QD2	HA416_0.1-0.2	1/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
400QT2	HA416_0.1-0.2	31/08/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA417_0.1-0.2	0.1-0.2	1/09/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	-	-	-	-	-	-	-	-	-	<1
HA417_0.4-0.5	0.4-0.5	1/09/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	-	-	-	-	-	-	-	-	-	<1
HA418_0.15-0.25	0.15-0.25	1/09/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	-	-	-	-	-	-	-	-	-	<1
HA418_0.7-0.8	0.7-0.8	1/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH419_0.5-0.6	0.5-0.6	5/09/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	<0.0016	<0.0016	<0.0008	<0.0016	<0.0016	<0.08	<0.0016	-	-	<1
BH420_0.5-0.5	0.5-0.6	5/09/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	-	-	-	-	-	-	-	-	-	<1
BH421_0.5-0.6	0.5-0.6	5/09/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	-	-	-	-	-	-	-	-	-	<1
BH421_0.9-1.0	0.9-1.0	5/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH422_0.4-0.5	0.4-0.5	5/09/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	-	-	-	-	-	-	-	-	-	<1
BH422_0.8-1.0	0.8-1.0	5/09/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	-	-	-	-	-	-	-	-	-	<1
BH425M_0.5-0.7	0.5-0.7	5/09/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	-	-	-	-	-	-	-	-	-	<1
BH425M_1.5-1.6	1.5-1.6	5/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH425M_1.8-2.0	1.8-2.0	5/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH425M_4.0-4.2	4.0-4.2	5/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
400TB3		5/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
400TS4		5/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP403_0.1	0.1	7/09/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	<0.0016	<0.0016	<0.0008	<0.0016	<0.0016	<0.08	<0.0016	-	-	<1
TP403_0.5	0.5	7/09/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	<0.0016	<0.0016	<0.0008	<0.0016	<0.0016	<0.08	<0.0016	-	-	<1
TP403_2.0	2	5/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP423_0.1	0.1	7/09/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	<0.0016	0.0060	0.0022	<0.0016	0.0021	<0.08	0.0060	-	-	<1
TP423_1.0	1	7/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP424_0.1-0.2	0.1-0.2	7/09/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	-	-	-	-	-	-	-	-	-	<1
TP424_0.5	0.5	7/09/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	-	-	-	-	-	-	-	-	-	<1
TP424_1.5	1.5	7/09/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	-	-	-	-	-	-	-	-	-	<1
TP424_2.5	2.5	7/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP427_0.1	0.1	7/09/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	-	-	-	-	-	-	-	-	-	<1
TP427_0.5	0.5	7/09/2022	-	<0.2	-	<0.2	-	<0.2	-	<0.1	<0.1	<0.2	-	-	-	-	-	-	-	-	-	-	<1
400QD3(QA101)	TP403_0.5	5/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
400QT3(QA101)	TP403_0.5	5/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
400TB5		7/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
400TS6		7/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

			Asbestos										
			Approximate Sample Mass	Asbestos from ACM in Soil (>7mm)	Asbestos from FA & AF in Soil (>2mm to <7mm)	Asbestos from FA & AF in Soil (<2mm)	Asbestos Reported Result	Organic/ Syntehtic Fibres - Comment	Bonded ACM in >7mm Sample	AF/FA in >2mm to <7mm Sample	AF/FA in <2mm Sample	Respirable Fibres - Comment
			g	%w/w	%w/w	%w/w	Comment	Comment	g	g	g	Comment
LOR												
NEPM 2013 EIL Comm./Ind., low pH, CEC, clay content - fresh												
0-2m												
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - fresh												
0-2m												
NSW 2014 General Solid Waste CT1 (No Leaching)												
NSW 2014 General Solid Waste SCC1 (with leached)												
NSW 2014 Restricted Solid Waste CT2 (No Leaching)												
NSW 2014 Restricted Solid Waste SCC2 (with leached)												
PFAS NEMP 2.0 Table 2 Health Industrial/Commercial (HIL C)												
PFAS NEMP 2.0 Table 2 Health Residential min soil access (HIL B)												
PFAS NEMP 2.0 Table 3 Ecological Direct Exposure - All Land Uses												
PFAS NEMP 2.0 Table 3 Ecological Indirect Exposure - All Land Uses												
NEPM 2013 ESL Comm./Ind., Fine Soil												
0-2m												
NEPM 2013 ESL UR/POS, Fine Soil												
0-2m												
NEPM 2013 HIL, Commercial/Industrial D				0.05	0.0001	0.0001						
NEPM 2013 HIL, Recreational C				0.02	0.001	0.001						
NEPM 2013 HIL, Residential B				0.04	0.001	0.001						
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand												
0-1m												
1-2m												
2-4m												
>4m												
NEPM 2013 Management Limits, C/I, Fine Soil												
NEPM 2013 Management Limits, R/P&POS, Fine Soil												
Field_ID	**Sample_Depth_Range**	**Sampled_Date_Time**										
BH302_0.1	0.1	29/11/2021	155	0.0E0	0.0E0	0.0E0	No asbestos detected at the reporting limit of 0.01% w/w.Organic fibre detected.No trace asbestos detected.	Organic fibres detected.	0.0E0	0.0E0	0.0E0	No trace asbestos detected.
BH302_1	1	29/11/2021	263	0.0E0	0.0E0	0.0E0	No asbestos detected at the reporting limit of 0.01% w/w.Organic fibre detected.No trace asbestos detected.	Organic fibres detected.	0.0E0	0.0E0	0.0E0	No trace asbestos detected.
BH302_3.5	3.5	29/11/2021	-	-	-	-	-	-	-	-	-	-
BH303_0.5	0.5	3/12/2021	171	0.0E0	0.0E0	0.0E0	No asbestos detected at the reporting limit of 0.01% w/w.Organic fibre detected.No trace asbestos detected.	Nil	0.0E0	0.0E0	0.0E0	No trace asbestos detected.
BH303_3.5	3.5	3/12/2021	-	-	-	-	-	-	-	-	-	-
BH303_5.0	5	3/12/2021	-	-	-	-	-	-	-	-	-	-
BH304_0.5	0.5	29/11/2021	987	0.0E0	0.0E0	0.0E0	No asbestos detected at the reporting limit of 0.01% w/w.Organic fibre detected.No trace asbestos detected.	Organic fibres detected.	0.0E0	0.0E0	0.0E0	No trace asbestos detected.
BH304_3	3	29/11/2021	784	0.0E0	0.0E0	0.0E0	No asbestos detected at the reporting limit of 0.01% w/w.Organic fibre detected.No trace asbestos detected.	Organic fibres detected.	0.0E0	0.0E0	0.0E0	No trace asbestos detected.
BH305A_0.1	0.1	30/11/2021	101	0.0E0	0.0E0	0.0E0	No asbestos detected at the reporting limit of 0.01% w/w.Organic fibre detected.No trace asbestos detected.	Organic fibres detected.	0.0E0	0.0E0	0.0E0	0.0E0
BH305A_2.0	2	30/11/2021	-	-	-	-	-	-	-	-	-	-
BH306_0.1	0.1	2/12/2021	387	0.0E0	0.0E0	0.0E0	No asbestos detected at the reporting limit of 0.01% w/w.Organic fibre detected.No trace asbestos detected.	Nil	0.0E0	0.0E0	0.0E0	No trace asbestos detected.
BH306_1.5	1.5	2/12/2021	-	-	-	-	-	-	-	-	-	-
BH306_5.0	5	2/12/2021	-	-	-	-	-	-	-	-	-	-
HA01_0.5	0.5	27/04/2022	409				No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.	Organic fibre detected	-	-	-	No trace asbestos detected.
HA01_1	1	27/04/2022	-	-	-	-	-	-	-	-	-	-
HA02_0.3	0.3	27/04/2022	-	-	-	-	-	-	-	-	-	-
HA02_0.8	0.8	27/04/2022	487				No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.	Organic fibre detected	-	-	-	No trace asbestos detected.
HA02_1.6	1.6	27/04/2022	-	-	-	-	-	-	-	-	-	-
BH317_0.0-0.2	0-0.2	10/06/2022	97	0.0E0	0.0E0	0.0E0	No asbestos detected at the reporting limit of 0.01% w/w.Organic fibre detected.No trace asbestos detected.	Organic fibres detected.	0.0E0	0.0E0	0.0E0	No trace asbestos detected.
BH317_1.0-1.1	1-1.1	10/06/2022	-	-	-	-	-	-	-	-	-	-
BH318_0.0-0.2	0-0.2	10/06/2022	49	0.0E0	0.0E0	0.0E0	No asbestos detected at the reporting limit of 0.01% w/w.Organic fibre detected.No trace asbestos detected.	Organic fibres detected.	0.0E0	0.0E0	0.0E0	No trace asbestos detected.
BH318_0.5-0.7	0.5-0.7	10/06/2022	-	-	-	-	-	-	-	-	-	-
BH319_0.0-0.2	0-0.2	10/06/2022	122	0.0E0	0.0E0	0.0E0	No asbestos detected at the reporting limit of 0.01% w/w.Organic fibre detected.No trace asbestos detected.	Organic fibres detected.	0.0E0	0.0E0	0.0E0	No trace asbestos detected.
BH319_1.0-1.1	1-1.1	10/06/2022	-	-	-	-	-	-	-	-	-	-
BH320_0-0.2	0-0.2	10/06/2022	127	0.0E0	0.0E0	0.0E0	No asbestos detected at the reporting limit of 0.01% w/w.Organic fibre detected.No trace asbestos detected.	Organic fibres detected.	0.0E0	0.0E0	0.0E0	-
BH320_1.0-1.1	1-1.1	10/06/2022	-	-	-	-	-	-	-	-	-	-
HA401_0.1-0.2	0.1-0.2	31/08/2022	-	-	-	-	No asbestos detected at the reporting limit of 0.01% w/w. No respirable fibres detected.	Organic fibres detected.	-	-	-	-
HA401_0.4-0.45	0.4-0.45	31/08/2022	-	-	-	-	No asbestos detected at the reporting limit of 0.01% w/w. No respirable fibres detected.	-	-	-	-	-
HA402_0.3-0.5	0.3-0.5	31/08/2022	-	-	-	-	No asbestos detected at the reporting limit of 0.01% w/w. No respirable fibres detected.	Organic fibres detected.	-	-	-	-
BH402_2.1-2.5	2.1-2.5	31/08/2022	-	-	-	-	-	-	-	-	-	-
HA404_0.1-0.2	0.1-0.2	31/08/2022	-	-	-	-	No asbestos detected at the reporting limit of 0.01% w/w. No respirable fibres detected.	Organic fibres detected.	-	-	-	-
HA405_0.1-0.2	0.1-0.2	31/08/2022	-	-	-	-	No asbestos detected at the reporting limit of 0.01% w/w. No respirable fibres detected.	Organic fibres detected.	-	-	-	-
400QD1	BH405_0.1-0.2	31/08/2022	-	-	-	-	-	-	-	-	-	-
400QT1	BH405_0.1-0.2	31/08/2022	-	-	-	-	-	-	-	-	-	-
HA406_0.1-0.2	0.1-0.2	31/08/2022	-	-	-	-	No asbestos detected at the reporting limit of 0.01% w/w. No respirable fibres detected.	Organic fibres detected.	-	-	-	-
HA406_0.75-0.9	0.75-0.9	31/08/2022	-	-	-	-	-	-	-	-	-	-
BH408_0.1-0.2	0.1-0.2	31/08/2022	-	-	-	-	No asbestos detected at the reporting limit of 0.01% w/w. No respirable fibres detected.	Organic fibres detected.	-	-	-	-
BH408_1.0-1.5	1-1.5	31/08/2022	-	-	-	-	-	-	-	-	-	-
BH408_2.1-2.4	2.1-2.4	31/08/2022	-	-	-	-	-	-	-	-	-	-
BH409_0.1-0.2	0.1-0.2	31/08/2022	-	-	-	-	No asbestos detected at the reporting limit of 0.01% w/w. No respirable fibres detected.	-	-	-	-	-
BH409_0.4-0.6	0.4-0.6	31/08/2022	-	-	-	-	No asbestos detected at the reporting limit of 0.01% w/w. No respirable fibres detected.	Organic fibres detected.	-	-	-	-
HA410_0.1-0.2	0.1-0.2	31/08/2022	-	-	-	-	No asbestos detected at the reporting limit of 0.01% w/w. No respirable fibres detected.	-	-	-	-	-
BH412_0.1-0.2	0.1-0.2	1/09/2022	-	-	-	-	No asbestos detected at the reporting limit of 0.01% w/w. No respirable fibres detected.	Organic fibres detected.	-	-	-	-
HA413_0.2-0.3	0.2-0.3	1/09/2022	-	-	-	-	No asbestos detected at the reporting limit of 0.01% w/w. No respirable fibres detected.	Organic fibres detected.	-	-	-	-
HA414_0.1-0.2	0.1-0.2	1/09/2022	-	-	-	-	No asbestos detected at the reporting limit of 0.01% w/w. No respirable fibres detected.	Organic fibres detected.	-	-	-	-
BH414_1.0-1.1	1-1.1	1/09/2022	-	-	-	-	-	-	-	-	-	-
BH415_0.1-0.2	0.1-0.2	1/09/2022	421	0.22	<0.001	<0.001	45x20x3mm cement sheet fragment detected. No respirable fibres detected.	-	6.06	<0.00001	<0.00001	Chrysotile asbetos detected
HA416_0.1-0.2	0.1-0.2	1/09/2022	-	-	-	-	No asbestos detected at the reporting limit of 0.01% w/w. No respirable fibres detected.	-	-	-	-	-
400QD2	HA416_0.1-0.2	1/09/2022	-	-	-	-	-	-	-	-	-	-
400QT2	HA416_0.1-0.2	31/08/2022	-	-	-	-	-	-	-	-	-	-
HA417_0.1-0.2	0.1-0.2	1/09/2022	-	-	-	-	No asbestos detected at the reporting limit of 0.01% w/w. No respirable fibres detected.	-	-	-	-	-
HA417_0.4-0.5	0.4-0.5	1/09/2022	-	-	-	-	No asbestos detected at the reporting limit of 0.01% w/w. No respirable fibres detected.	-	-	-	-	-
HA418_0.15-0.25	0.15-0.25	1/09/2022	-	-	-	-	No asbestos detected at the reporting limit of 0.01% w/w. No respirable fibres detected.	-	-	-	-	-
HA418_0.7-0.8	0.7-0.8	1/09/2022	-	-	-	-	-	-	-	-	-	-
BH419_0.5-0.6	0.5-0.6	5/09/2022	-	-	-	-	No asbestos detected at the reporting limit of 0.01% w/w. No respirable fibres detected.	-	-	-	-	-
BH420_0.5-0.5	0.5-0.6	5/09/2022	-	-	-	-	No asbestos detected at the reporting limit of 0.01% w/w. No respirable fibres detected.	-	-	-	-	-
BH421_0.5-0.6	0.5-0.6	5/09/2022	-	-	-	-	No asbestos detected at the reporting limit of 0.01% w/w. No respirable fibres detected.	-	-	-	-	-
BH421_0.9-1.0	0.9-1.0	5/09/2022	-	-	-	-	No asbestos detected at the reporting limit of 0.01% w/w. No respirable fibres detected.	-	-	-	-	-
BH422_0.4-0.5	0.4-0.5	5/09/2022	-	-	-	-	No asbestos detected at the reporting limit of 0.01% w/w. No respirable fibres detected.	-	-	-	-	-
BH422_0.8-1.0	0.8-1.0	5/09/2022	-	-	-	-	No asbestos detected at the reporting limit of 0.01% w/w. No respirable fibres detected.	-	-	-	-	-
BH425M_0.5-0.7	0.5-0.7	5/09/2022	620	<0.01	<0.001	<0.001	No asbestos detected at the reporting limit of 0.01% w/w. No respirable fibres detected.	-	<0.001	<0.00001	<0.00001	No asbestos detected.
BH425M_1.5-1.6	1.5-1.6	5/09/2022	-	-	-	-	-	-	-	-	-	-
BH425M_1.8-2.0	1.8-2.0	5/09/2022	-	-	-	-	-	-	-	-	-	-
BH425M_4.0-4.2	4.0-4.2	5/09/2022	-	-	-	-	-	-	-	-	-	-
400TB3		5/09/2022	-	-	-	-	-	-	-	-	-	-
400TS4		5/09/2022	-	-	-	-	-	-	-	-	-	-
TP403_0.1	0.1	7/09/2022	573	<0.01	<0.001	<0.001	No asbestos detected at the reporting limit of 0.01% w/w.	-	<0.001	<0.00001	<0.00001	No asbestos detected.
TP403_0.5	0.5	7/09/2022	492	<0.01	<0.001	<0.001	No asbestos detected at the reporting limit of 0.01% w/w.	-	<0.001	<0.00001	<0.00001	No asbestos detected.
TP403_2.0	2	5/09/2022	-	-	-	-	-	-	-	-	-	-
TP423_0.1	0.1	7/09/2022	395	<0.01	<0.001	<0.001	No asbestos detected at the reporting limit of 0.01% w/w.	-	<0.001	<0.00001	<0.00001	No asbestos detected.
TP423_1.0	1	7/09/2022	471	<0.01	<0.001	<0.001	No asbestos detected at the reporting limit of 0.01% w/w.	-	<0.001	<0.00001	<0.00001	No asbestos detected.
TP424_0.1-0.2	0.1-0.2	7/09/2022	438	<0.01	<0.001	<0.001	No asbestos detected at the reporting limit of 0.01% w/w.	-	<0.001	<0.00001	<0.00001	No asbestos detected.
TP424_0.5	0.5	7/09/2022	529	<0.01	<0.001	<0.001	No asbestos detected at the reporting limit of 0.01% w/w.	-	<0.001	<0.00001	<0.00001	No asbestos detected.
TP424_1.5	1.5	7/09/2022	388	<0.01	<0.001	<0.001	No asbestos detected at the reporting limit of 0.01% w/w.	-	<0.001	<0.00001	<0.00001	No asbestos detected.
TP424_2.5	2.5	7/09/2022	-	-	-	-	-	-	-	-	-	-
TP427_0.1	0.1	7/09/2022	691	<0.01	<0.001	<0.001	No asbestos detected at the reporting limit of 0.01% w/w.	-	<0.001	<0.00001	<0.00001	No asbestos detected.
TP427_0.5	0.5	7/09/2022	-	-	-	-	-	-	-	-	-	-
400QD3(QA101)	TP403_0.5	5/09/2022	-	-	-	-	-	-	-	-	-	-
400QT3(QA101)	TP403_0.5	5/09/2022	-	-	-	-	-	-	-	-	-	-
400TB5		7/09/2022	-	-	-	-	-	-	-	-	-	-
400TS6		7/09/2022	-	-	-	-	-	-	-	-	-	-

				TPH					CRC Care TPH Fractions							BTEX								
				C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)	C6-C10	C10-C16	C16-C34 (F3)	C34-C40 (F4)	C10 - C40 (Sum of total)	F1: C6-C10 less BTEX	F2: >C10-C16 less NAPHTHALENE	Naphthalene (VOC)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Total BTEX	Xylene Total	Total Phenols
				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	ug/L	µg/L
EQL				10	50	100	100	50	10	50	100	100	50	10	50	0.5	0.5	0.5	0.5	1	0.5	3	1.5	50
ANZG (2018) Freshwater 95% toxicant DGVs																	950	180	80	275	350			
ANZG (2018) Freshwater 99% toxicant DGVs																	600	110			200			
PFAS NEMP (2020) Freshwater 95% Exposure Scenario																								
ANZG (2018) Marine water 95% toxicant DGVs																								
ANZG (2018) Marine water 99% toxicant DGVs																								
PFAS NEMP (2020) Interim Marine 95% Exposure Scenario																								
ADWG 2019 Health																	1	800	300				600	
AS2159-2009 Piling - Design and Installation, Table 6.4.2(c)																								
Non-aggressive																								
Mild																								
Moderate																								
Severe																								
NEPM 2013 GW HSL Commercial/Industrial D, for Vapour Intrusion, Sand																								
2-4m														6000	NL		5000	NL	NL				NL	
4-8m														6000	NL		5000	NL	NL				NL	
>8m														7000	NL		5000	NL	NL				NL	
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand																								
2-4m														1000	1000		800	NL	NL				NL	
4-8m														1000	1000		800	NL	NL				NL	
>8m														1000	1000		900	NL	NL				NL	
Site_ID	**Field_ID**	**Location_Code**	**Sampled_Date_Time**																					
304100230	BH202	BH202	12/01/2022	<20	<50	<100	<100	<100	<20	<50	<100	<100	<100	<20	<50	<10	<1	<1	<1	<2	<1	-	<3	-
304100230	BH303	BH303	12/01/2022	<20	230	<100	<100	230	<20	70	<100	<100	<100	<20	70	<10	<1	<1	<1	<2	<1	-	<3	-
304100230	QC100	BH202 - QC100	12/01/2022	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<10	<50	<10	<1	<1	<1	<2	<1	-	-	-
304100230	GWBH201-2	BH201	16/09/2022	<40	<50	<200	<200	-	<50	<60	<500	<500	<320	<50	<60	<0.5	<0.5	0.6	<0.5	<1	<0.5	<3	<1.5	<50
304100230	GWBH202-2	BH202	16/09/2022	<40	<50	<200	<200	-	<50	<60	<500	<500	<320	<50	<60	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<3	<1.5	<50
304100230	GWBH303-2	BH303	20/09/2022	<40	<50	<200	<200	-	<50	<60	<500	<500	<320	<50	<60	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<3	<1.5	<50
304100230	GWQD1-2	BH201 - GWQD2-2	16/09/2022	<40	-	-	-	-	<50	-	-	-	-	<50	-	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<3	<1.5	-
304100230	GWQT1-2	BH201 - GWQT2-2	16/09/2022	<20	<50	<100	<100	<100	<20	<50	<100	<100	<100	<20	<50	<10	<1	<1	<1	<2	<1	-	<3	-
304100230	GWQD1-2	BH303 - GWQD2-2	20/09/2022	<40	<50	<200	<200	-	<50	<60	<500	<500	<320	<50	<60	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<3	<1.5	<50
304100230	GWQT1-2	BH303 - GWQT2-2	20/09/2022	<20	<50	<100	<100	<100	<20	<50	<100	<100	<100	<20	<50	<10	<1	<1	<1	<2	<1	-	<3	<100

				Metals															
				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
EQL				1	1	0.2	0.1	1	1	1	1	1	1	0.1	0.1	1	1	5	5
ANZG (2018) Freshwater 95% toxicant DGVs				24	24	0.2	0.2	4.4 (Cr VI)	4.4 (Cr VI)	1.4	1.4	3.4	3.4	0.6	0.6	11	11	8	8
ANZG (2018) Freshwater 99% toxicant DGVs						0.06	0.06							0.06	0.06	8	8		
PFAS NEMP (2020) Freshwater 95% Exposure Scenario																			
ANZG (2018) Marine water 95% toxicant DGVs																			
ANZG (2018) Marine water 99% toxicant DGVs																			
PFAS NEMP (2020) Interim Marine 95% Exposure Scenario																			
ADWG 2019 Health				10	10	2	2	50 (Cr VI)	50 (Cr VI)	2000	2000	10	10	1	1	20	20		
AS2159-2009 Piling - Design and Installation, Table 6.4.2(c)																			
Non-aggressive																			
Mild																			
Moderate																			
Severe																			
NEPM 2013 GW HSL Commercial/Industrial D, for Vapour Intrusion, Sand																			
2-4m																			
4-8m																			
>8m																			
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand																			
2-4m																			
4-8m																			
>8m																			
Site_ID	Field_ID	Location_Code	Sampled_Date_Time																
304100230	BH202	BH202	12/01/2022	4	<1	<0.2	<0.2	<1	<1	4	3	<0.001	<0.001	<0.0001	<0.0001	6	5	20	18
304100230	BH303	BH303	12/01/2022	1	<1	0.2	0.2	2	<1	8	2	0.004	<0.001	<0.0001	<0.0001	17	14	47	31
304100230	QC100	BH202 - QC100	12/01/2022	3	3	<0.1	<0.1	<1	<1	5	4	<0.001	<0.001	<0.0005	<0.0005	6	5	17	16
304100230	GWBH201-2	BH201	16/09/2022	-	<1	-	<0.1	-	<1	-	1	-	<1	-	<0.1	-	24	-	17
304100230	GWBH202-2	BH202	16/09/2022	-	3	-	<0.1	-	<1	-	2	-	<1	-	<0.1	-	50	-	36
304100230	GWBH303-2	BH303	20/09/2022	-	<1	-	<0.1	-	<1	-	<1	-	<1	-	<0.1	-	15	-	24
304100230	GWQD1-2	BH201 - GWQD2-2	16/09/2022	-	<1	-	<0.1	-	<1	-	1	-	<1	-	<0.1	-	23	-	17
304100230	GWQT1-2	BH201 - GWQT2-2	16/09/2022		<1		<0.2		<1		<1		<1		<0.1		21		15
304100230	GWQD1-2	BH303 - GWQD2-2	20/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
304100230	GWQT1-2	BH303 - GWQT2-2	20/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

				PAH													Organophosphorous Pesticides						Pesticides
				Naphthalene	2-methylnaphthalene	1-Methylnaphthalene	Phenanthrene	Benzo(a)pyrene	Benzo(a)pyrene TEQ (WHO)	PAHs (Sum of total)	Chlordane	DDT	Endrin	g-BHC (Lindane)	Heptachlor	Toxaphene	Azinophos methyl	Chlorpyrifos	Diazinon	Dimethoate	Fenitrothion	Malathion	Parathion
				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
EQL				0.01	0.1	0.1	0.01	0.00001	5	0.01	0.01	0.01	0.01	0.01	0.01	0.002	1	10	1	1	1	1	1
ANZG (2018) Freshwater 95% toxicant DGVs				16				0.1			0.08	0.01	0.01	0.2	0.09	0.0002	0.02	0.01	0.01	0.15	0.2	0.05	0.004
ANZG (2018) Freshwater 99% toxicant DGVs				2.5							0.03	0.006	0.02	0.07	0.01	0.0001	0.01	0.00004	0.00003	0.1	0.1	0.002	0.0007
PFAS NEMP (2020) Freshwater 95% Exposure Scenario																							
ANZG (2018) Marine water 95% toxicant DGVs																							
ANZG (2018) Marine water 99% toxicant DGVs																							
PFAS NEMP (2020) Interim Marine 95% Exposure Scenario																							
ADWG 2019 Health								0.01															
AS2159-2009 Piling - Design and Installation, Table 6.4.2(c)																							
Non-aggressive																							
Mild																							
Moderate																							
Severe																							
NEPM 2013 GW HSL Commercial/Industrial D, for Vapour Intrusion, Sand																							
2-4m				NL																			
4-8m				NL																			
>8m				NL																			
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand																							
2-4m				NL																			
4-8m				NL																			
>8m				NL																			
Site_ID	Field_ID	Location_Code	Sampled_Date_Time																				
304100230	BH202	BH202	12/01/2022	<1			<1	<0.001	-	<1	<2	<0.2	<0.2	<0.2	<0.2	<0.005	<2	<2	<2	<2	<2	<2	<2
304100230	BH303	BH303	12/01/2022	<1			<1	<0.001	-	<1	<2	<0.2	<0.2	<0.2	<0.2	<0.005	<2	<2	<2	<2	<2	<2	<2
304100230	QC100	BH202 - QC100	12/01/2022	<1			<1	<0.001	<5	-	-	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-
304100230	GWBH201-2	BH201	16/09/2022	0.04	0.01	<0.01	<0.02	<0.01	<0.012	<0.1	<0.01	<0.01	<0.02	<0.05	<0.02	-	<0.05	<0.01	<0.01	<0.15	<0.2	<0.05	<0.01
304100230	GWBH202-2	BH202	16/09/2022	0.03	0.01	<0.01	<0.02	<0.01	<0.012	<0.1	<0.01	<0.01	<0.02	<0.05	<0.02	-	<0.05	<0.01	<0.01	<0.15	<0.2	<0.05	<0.01
304100230	GWBH303-2	BH303	20/09/2022	<0.02	0.02	0.01	0.02	<0.01	<0.012	<0.1	<0.01	<0.01	<0.02	<0.05	<0.02	-	<0.05	<0.01	<0.01	<0.15	<0.2	<0.05	<0.01
304100230	GWQD1-2	BH201 - GWQD2-2	16/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
304100230	GWQT1-2	BH201 - GWQT2-2	16/09/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
304100230	GWQD1-2	BH303 - GWQD2-2	20/09/2022	0.03	0.03	0.03	0.02	<0.01	<0.012	0.1	<0.01	<0.01	<0.02	<0.05	<0.02	-	<0.05	<0.01	<0.01	<0.15	<0.2	<0.05	<0.01
304100230	GWQT1-2	BH303 - GWQT2-2	20/09/2022	<0.001	-	-	<0.001	<0.001	-	<0.001	<2	<0.2	<0.2	<0.2	<0.2	<0.005	<2	<2	<2	<2	<2	<2	<2

				Polychlorinated Biphenyls		PFAS		SVOCs	Volatile Organic Compounds														
				Arochlor 1242	Arochlor 1254	PFOS	PFOA	EPN	1,1,2-trichloroethane	1,1-dichloroethene	1,2-dichloroethane	Carbon tetrachloride	Chloroform	Dichloromethane	Trichloroethene	Vinyl chloride	1,2-dibromoethane	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	Bromobenzene	Chlorobenzene	Total VOCs
				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
EQL				1	1			1	1	1	1	1	5	5	1	5	1	1	1	1	1	1	10
ANZG (2018) Freshwater 95% toxicant DGVs				0.6	0.03				6500									160	260	60			
ANZG (2018) Freshwater 99% toxicant DGVs				0.3	0.01				5400									120	160	40			
PFAS NEMP (2020) Freshwater 95% Exposure Scenario						0.13	220																
ANZG (2018) Marine water 95% toxicant DGVs																							
ANZG (2018) Marine water 99% toxicant DGVs																							
PFAS NEMP (2020) Interim Marine 95% Exposure Scenario						0.13	220																
ADWG 2019 Health										30	3	3		4	50	0.3	1		1500	40	1	300	
AS2159-2009 Piling - Design and Installation, Table 6.4.2(c)																							
Non-aggressive																							
Mild																							
Moderate																							
Severe																							
NEPM 2013 GW HSL Commercial/Industrial D, for Vapour Intrusion, Sand																							
2-4m																							
4-8m																							
>8m																							
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand																							
2-4m																							
4-8m																							
>8m																							
Site_ID	**Field_ID**	**Location_Code**	**Sampled_Date_Time**																				
304100230	BH202	BH202	12/01/2022	<5	<5	-	-	<2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
304100230	BH303	BH303	12/01/2022	<5	<5	-	-	<2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
304100230	QC100	BH202 - QC100	12/01/2022	<2	<2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
304100230	GWBH201-2	BH201	16/09/2022	<1	<1	<0.002	0.003	-	<0.5	<0.5	<0.5	<0.5	9.5	<5	<0.5	<0.3	<0.5	<0.5	<0.5	<0.3	<0.5	<0.5	10
304100230	GWBH202-2	BH202	16/09/2022	<1	<1	0.013	0.061	-	<0.5	<0.5	0.7	<0.5	<0.5	<5	<0.5	<0.3	0.7	<0.5	<0.5	<0.3	<0.5	<0.5	<10
304100230	GWBH303-2	BH303	20/09/2022	<1	<1	<0.002	<0.002	-	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.3	<0.5	<0.5	<0.5	<0.3	<0.5	<0.5	<10
304100230	GWQD1-2	BH201 - GWQD2-2	16/09/2022	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	9.4	<5	<0.5	<0.3	<0.5	<0.5	<0.5	<0.3	<0.5	<0.5	10
304100230	GWQT1-2	BH201 - GWQT2-2	16/09/2022	-	-	-	-	-	<1	<1	<1	<1	8	<1	<5	<0.05	<1	<1	<1	<1	<1	<1	-
304100230	GWQD1-2	BH303 - GWQD2-2	20/09/2022	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
304100230	GWQT1-2	BH303 - GWQT2-2	20/09/2022	<5	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-